DISSERTATION

FOR THE AWARD OF DEGREE OF

MASTER OF HOSPITAL ADMINISTRATION

SESSION 2022-2024

"Work-Related Musculoskeletal Discomfort and Occupational Stress among Healthcare Workers: A Cross-Sectional Study"

JASPREET KAUR

SANTOSH DEEMED TO BE UNIVERSITY
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Respected Sir,

I request you to kindly consider and register the subject of my dissertation entitled **"Work-Related Musculoskeletal Discomfort and Occupational Stress among Healthcare Workers: A Cross-Sectional Study"** for the year 2022-2024 with the view to appear in MHA examination in 2024.

The dissertation with six copies and necessary particulars is enclosed herewith.

Thanking you

Yours truly

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JASPREET KAUR

(Batch 2022-2024)

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Introduction

WRMSD stands for work-related musculoskeletal discomfort and this is a pain or discomfort felt by any person in the musculoskeletal system emanating from activities done at the workplace that affects muscles, nerves, tendons, ligaments, joints, cartilage or any spinal disc. This discomfort can be mild or severe and can manifest in different areas of the body; neck, shoulders, back, arms, hands and legs. WRMSD means various disorders that occur as a result of stress and strain on your body while carrying out your duties at the workplace. Although WRMSDs are not necessarily incapacitating they could prove to be rather uncomfortable and interfere with workers' productivity a great deal. If you have any discomfort signals, you should not neglect them as they may bring other complications.

In modern workplaces, the prevalence of work-related musculoskeletal discomfort (WRMSD) has become a significant concern affecting employees across various industries. WRMSD encompasses a spectrum of musculoskeletal issues, including but not limited to, muscle strains, joint pain and repetitive strain injuries. Work-related musculoskeletal discomfort (WRMSD) is a prevalent issue affecting individuals across various occupational settings. It encompasses a spectrum of conditions ranging from mild discomfort to debilitating injuries, significantly impacting an individual's well-being and productivity. These discomforts often arise due to repetitive motions, ergonomic mismatches, prolonged periods of sedentary work, or physically demanding tasks, among other factors.

WRMSDs are one of the most extensive occupational health challenges that can be evidenced globally. These are injuries or pains that occur on the muscles, tendons, ligaments, nerves and joints as a result of exposure to the working conditions of a particular industry.

In an attempt to eliminate the risks of discomfort, loss of productivity, and disability caused by WRMSDs, there is a need to understand the causes behind such conditions. Let's delve into the main culprits behind these conditions-

1. Biomechanical Factors:

Repetitive motions: Repetition of the same movement for a long period in a work cycle tends to exert much stress on the muscles and joints. Specifically, assembly line workers, cashiers and data entry personnel are at the highest risk.

Awkward postures: It stresses muscles, ligaments as well as tendons due to the inability to uphold uncomfortable positions for equal to or more than twenty-four hours. This could entail such things like using the hand to stretch up high for several hours, bending down for several hours or even working with bent back.

Forceful exertions: Occupations that entail repetitive things lifting, pushing, pulling, or forceful grasping are therefore, likely to result in WRMSDs. Scaffold erection and joining, lifting a patient by a nurse, and mowing the lawn are activities that increase the chance of an accident.

Vibration: Person working with power tools or machinery that causes continuing vibration affects the nerves, blood vessels, and muscles of the hands and upper arms.

2. Work Organization Factors:

Workplace design: Improper design of workstations and inadequate furniture that fails to encourage the right posture when working or furniture that cannot be adjusted can lead to WRMSDs.

Pace of work: When one is forced to work as fast as possible without adequate spell-out time, the possibilities of getting injured are high.

Long working hours: Failure to incorporate adequate rest periods in the long working shifts means that fatigue is permitted to build up and when muscles are strained, they will be much more prone to strains as opposed to when they are fresh.

Lack of control over work: Lack of control over working conditions, tasks that one is supposed to perform and workload also contributes to WRMSDs.

3. Environmental Factors:

Temperature extremes: Employment in extremely hot or cold weather can cause the muscles to get rigid and constricted blood circulation hence causing injuries.

Poor lighting: Bending forward to see by poor light affects the neck and shoulder muscles leading to aches.

4. Individual Risk Factors:

Pre-existing conditions: Pre-existing injuries or musculoskeletal disorders make people vulnerable to WRMDs.

Poor overall fitness: Some of the general factors include failure to exercise the central muscles and poor stretching hence enhancing the likelihood of WRMSDs.

Lifestyle habits: Smoking, the poor sleep cycle and unhealthy diet are some of the factors that if intensified can slow down the recovery time and possibly lead to emergence of WRMSDs.

5. Psychosocial Factors:

Stress: Some of the impacts of work-related stress on workers are muscle tension through stress, and this worsens the WRMSD symptoms.

Job insecurity: These factors are likely to cause anxiety and affect the general health of employees thereby exposing them to higher risk of WRMSDs due to likelihood of job loss.

Poor communication: Communication between the employees and the management on workload, expectation, and safety can be a cause of work stress and WRMSDs.

Here's a breakdown of some common types of WRMSDs

Carpal Tunnel Syndrome: It is a condition that occurs in the neck, brings pain at the base of the neck and into the shoulder blade, the arm, hand, and fingers with symptoms such as numbness, tingling, and pain in the thumb and first three fingers. It is so widespread in occupations involving repeated wrist bending as in typing, repetitive mechanical operations, or operations involving vibration tools such as assembly line work.

Tendinitis: Despite their diverse classification, tendinitis, inflammation of a tendon, which is the fibrous structure that reconnects muscles to bones, is a popular WRMSD. It has been reported to affect the Shoulder (Rotator cuff tendinitis), elbow (Tennis elbow or Golfers elbow) and Wrist.

Bursitis: Bursae are also referred to as gliding bags that contain liquids found close to the joints. Inflammations of bursae known are bursitis and can develop in the shoulder, elbow, hips, knee, and the ankle due to repetitive movements or pressure in the area. The signs include pain, puffiness, and limited' range of motion of the joint.

Lower Back Pain: Lifting, bending and twisting motions are associated with WRMSDs and the lower back is easily susceptible to them. Strain or pulling on muscles, a stretch or twist of ligament, and rupture of disc can lead to lower backache.

Neck and Shoulder Pain: Neck and shoulder straining are most likely to happen where one spends most of his/her working time sitting, typing on the computer, or doing some overhead work. It can cause pain, stiffness and often, headaches to the affected part of the body.

Thoracic Outlet Syndrome: Nerves and blood vessels here become compressed leading to pain, numbness and even weakness of the arm and hand. This condition is common with individuals who take their arms high such as cooks, mechanics, painters, swimmers among others.

Tension Neck Syndrome (TNS): TNS refers to the state whereby the muscles in the neck becomes painful and rigid. This condition may be a consequence of prolonged sitting in front of the computer or any other equipment where one's back is inclined inadequately. These are muscle contraction, muscle twitching and the commonly reported headaches that tend to affect the nape zone, radiating in the shoulders and the mid upper back region.

Rotator Cuff Injuries can be described as the injuries to the set of muscles and tendons that maintain the shoulder joint. These are injuries that arise from the regular use of the arms above the head or any other strenuous activities such as lifting. Signs of this disorder include pain at the shoulder region, you may be weak especially when lifting the arm steady and minimum range of motion when you lift your arm.

Epicondylitis is typically referred to as tennis elbow, or golfer's elbow, and it is characterized by inflammation of the tendons that are connected to the bone of the elbow. Tennis elbow is usually manifested on the lateral joint of the elbow, while golfer's elbow is located on the medial joint. Both conditions are attributed to one's wrist and arm movements throughout their work or other activities. Symptoms may consist of pain and swelling of the elbow and the forearm and may lead to weakness and impairment of hand grip strength.

De Quervain's Tenosynovitis is commonly seen as an encumbrance of the tendons of the wrist occupying the thumb side. It is mainly a result of usage of hands or wrists in repetitive jobs such as texting, lifting or the like. Some of the signs are painful swelling about the wrist and the base of the thumb – inability to pinch or grip.

They influence the tissues targeted by the activities involving recurrent exertion of force plus stretching or in positions that are uncomfortable to keep for longer durations.

Impact of Work-Related Musculoskeletal Discomfort (WRMSD) on Employees

1. Health and Well-being

Chronic Pain: WRMSDs can lead to persistent pain, affecting daily activities and quality of life. Conditions like lower back pain, carpal tunnel syndrome, and tendinitis can become long-term health issues.

Reduced Mobility: Musculoskeletal discomfort can limit an employee's range of motion and flexibility, making it difficult to perform both work-related and personal tasks.

Mental Health: Chronic pain and discomfort can contribute to mental health issues such as stress, anxiety, and depression, further impacting an employee's overall well-being.

2. Job Performance

Decreased Productivity: Pain and discomfort can reduce an employee's ability to concentrate and perform tasks efficiently, leading to decreased productivity.

Increased Errors: Physical discomfort can impair an employee's focus and precision, resulting in more mistakes and lower quality of work.

Absenteeism: Employees suffering from WRMSDs are more likely to take sick leave to recover from pain and injury, leading to increased absenteeism.

3. Financial Impact

Medical Expenses: Employees may incur significant out-of-pocket expenses for medical treatments, therapies, and medications.

Lost Wages: Time off work due to WRMSDs can result in lost wages, especially if the employee exhausts their sick leave or is unable to work for extended periods.

Impact of WRMDs on Employers

1. Productivity and Efficiency

Decreased Overall Productivity: The reduced productivity of affected employees can slow down overall operations and impact the organization's efficiency.

Increased Turnaround Time: Tasks may take longer to complete, and projects may be delayed due to the decreased capability of employees suffering from WRMSDs.

2. Financial Costs

Healthcare Costs: Employers often bear the cost of medical treatments through health insurance plans. Increased claims for WRMSD-related treatments can raise overall healthcare costs.

Workers' Compensation: Employers may face higher workers' compensation claims and premiums due to the frequency and severity of musculoskeletal injuries.

Training and Recruitment: High turnover due to WRMSDs may require employers to spend more on recruiting, hiring, and training new employees to replace those who can no longer work.

3. Workplace Morale and Culture

Decreased Employee Morale: The presence of WRMSDs in the workplace can lower morale as employees may feel unsupported or anxious about their health.

Higher Stress Levels: Increased workloads for other employees to compensate for the reduced productivity or absence of their colleagues can raise stress levels.

Reputation: A workplace known for high rates of WRMSDs can develop a negative reputation, making it harder to attract and retain top talent.

4. Legal and Regulatory Compliance

Compliance Issues: Employers are required to provide a safe working environment under occupational health and safety regulations. Failure to address WRMSD risks can result in legal consequences and penalties.

Litigation Risks: Employees suffering from WRMSDs may seek legal action against employers, leading to costly lawsuits and potential settlements.

Legal Rights and Responsibilities Regarding WRMSD

1. Employer Responsibilities

Providing a Safe Workplace: Employers are legally required to provide a safe and healthy working environment. This includes identifying and mitigating risks that could lead to WRMSDs.

Ergonomic Assessments: Employers should conduct ergonomic assessments to identify potential hazards and implement changes to reduce the risk of WRMSDs. This can include adjusting workstations, providing ergonomic equipment, and redesigning tasks to minimize repetitive strain.

Training and Education: Employers must provide training and education to employees about the risks of WRMSDs and how to prevent them. This includes proper lifting techniques, safe use of tools, and recognizing early symptoms of musculoskeletal discomfort.

Reporting and Recordkeeping: Employers are required to maintain records of work-related injuries and illnesses, including WRMSDs, and report severe cases to the appropriate regulatory bodies.

Workers' Compensation: Employers must provide workers' compensation benefits to employees who suffer from WRMSDs as a result of their job. This includes covering medical expenses and providing wage replacement for time off work.

2. Employee Rights

Right to a Safe Workplace: Employees have the right to work in an environment that is free from recognized hazards that can cause WRMSDs.

Right to Report: Employees can report unsafe working conditions and work-related injuries, including WRMSDs, without fear of retaliation.

Access to Medical Care: Employees suffering from WRMSDs are entitled to seek medical treatment and should receive appropriate care through their employer's health insurance or workers' compensation program.

Compensation for Injuries: Employees are entitled to compensation for work-related injuries, including coverage of medical expenses and wage replacement through workers' compensation benefits.

WRMDs in Healthcare:

Healthcare professionals are heroes, dedicated to caring for others. However, the very nature of their work puts them at high risk for Work-Related Musculoskeletal Disorders (WRMSDs). These conditions can cause pain, discomfort, and even disability, impacting not only their well-being but also patient care.

Risk Factors for WRMSDs in Healthcare:

Heavy Lifting and Awkward Postures: Nurses lifting patients, physical therapists performing manual therapy, and surgeons maintaining prolonged postures during procedures are all susceptible.

Repetitive Motions: Dentists performing intricate procedures, nurses administering injections, and technicians drawing blood all face repetitive hand and arm movements.

Long Periods of Standing: Surgeons operating for hours, nurses constantly on their feet caring for patients, and technicians performing X-rays are all at risk.

Forceful Exertion: Holding heavy equipment, restraining uncooperative patients, or manoeuvring bulky wheelchairs can lead to WRMSDs.

Psychosocial Stress: Long hours, demanding workloads, and emotional stress can contribute to muscle tension and exacerbate WRMSD symptoms.

Common WRMDs Affecting Healthcare Workers:

Back Pain: This is the most prevalent WRMSD in healthcare, often caused by lifting patients, bending over beds, and twisting awkwardly.

Carpal Tunnel Syndrome: Repetitive hand and wrist movements like typing, writing, and using medical equipment can compress the median nerve, leading to pain, numbness, and tingling.

Neck and Shoulder Pain: Poor posture while sitting at computers, hunching over patients, and prolonged overhead work can strain these areas.

Tendinitis: Inflammation of tendons, particularly in the shoulders (rotator cuff) and elbows (tennis elbow), can occur due to repetitive motions.

The Impact of WRMDs in Healthcare:

Reduced Patient Care Quality: Pain and discomfort can affect a healthcare worker's ability to perform tasks effectively, potentially compromising patient care.

Increased Absenteeism and Turnover: WRMSDs can lead to frequent absences and even career changes due to chronic pain.

High Costs: WRMSDs are a significant financial burden for healthcare institutions due to increased workers' compensation claims, healthcare costs, and lost productivity.

Burnout and Decreased Job Satisfaction: Chronic pain and discomfort can lead to burnout and decreased job satisfaction among healthcare workers.

Understanding the prevalence, risk factors, and consequences of WRMSD is crucial for implementing effective prevention strategies and promoting a healthier work environment. Understanding the complexities of WRMSD is vital for both the well-being of employees and the productivity of organizations. WRMSD not only leads to physical discomfort and pain but also contributes to higher rates of absenteeism, decreased productivity, increased healthcare costs, and potential long-term disabilities. Therefore, there is a pressing need to comprehensively investigate WRMSD to develop effective prevention strategies and interventions.

Occupational Stress

Occupational stress refers to the physical and emotional stress experienced as a result of the demands and pressures associated with one’s job. This can be triggered by a variety of stressors which relate to the work environment, type/classification of job and individual attributes. It arises when job demands exceed the resources and coping abilities of employees, leading to physical, emotional, and psychological strain. Occupational stress is quite simply how you feel overwhelmed or under pressure while on the job. When the demands of work don't align with where an employee's abilities, resources or needs are.

Occupational stress, often referred to as job stress, is a prevalent concern in modern workplaces. With the changing nature of work, characterized by increasing demands, rapid technological advancements, and economic pressures, understanding and addressing

occupational stress has become crucial for both employee well-being and organizational success.

Causes of Occupational Stress

Workload and Time Pressure

One of the primary causes of occupational stress is excessive workload and time pressure. Employees often face unrealistic deadlines, high expectations, and an overwhelming amount of tasks. This can lead to a sense of being constantly under pressure, which, over time, can result in chronic stress.

Work Environment

The physical conditions of the workplace play a significant role in causing stress. Poor lighting, excessive noise, uncomfortable seating, and inadequate ventilation can make the work environment unpleasant and stressful. Additionally, unsafe or hazardous working conditions can heighten stress levels as employees may constantly worry about their safety.

Role Ambiguity and Conflict

Role ambiguity occurs when employees are unclear about their job responsibilities and expectations. Role conflict arises when there are conflicting demands from different stakeholders or within the same role. Both conditions can lead to confusion, frustration, and stress, as employees struggle to meet inconsistent or unclear expectations.

Lack of Control

Employees who have little control over their work processes and decision-making often experience higher levels of stress. The inability to influence outcomes and the feeling of being micromanaged can contribute to a sense of helplessness and decreased job satisfaction.

Poor Work-Life Balance

The blurring of boundaries between work and personal life, especially with the rise of remote work, has intensified the challenge of maintaining a healthy work-life balance. Long working hours, constant connectivity, and the inability to disconnect from work can lead to burnout and stress.

Interpersonal Relationships

Workplace relationships, including interactions with supervisors, colleagues, and subordinates, play a significant role in occupational stress. Conflicts, lack of support, and poor communication can create a stressful work environment, affecting employees' mental health.

Job Insecurity

Concerns about job stability and future employment prospects can cause considerable stress. In times of economic uncertainty or organizational changes, fear of layoffs, downsizing, or restructuring can create a climate of anxiety and insecurity. This stress is often exacerbated by the potential financial implications of losing one's job.

Symptoms of Occupational Stress

Physical Symptoms

Occupational stress manifests in various physical symptoms such as headaches, fatigue, muscle tension, and gastrointestinal issues. Chronic stress can also contribute to more severe health problems like cardiovascular diseases and weakened immune function.

Emotional and Psychological Symptoms

Emotional and psychological symptoms of occupational stress include anxiety, depression, irritability, and a sense of hopelessness. These symptoms can lead to decreased motivation, job dissatisfaction, and a negative impact on overall mental health.

Behavioural Symptoms

Behavioural changes such as absenteeism, decreased productivity, and increased use of substances like alcohol or drugs can also indicate occupational stress. These behaviours can further exacerbate stress and negatively impact job performance and personal well-being.

Consequences of Occupational Stress

Occupational stress can wreak havoc on both employees and the organizations they work for. Here's a breakdown of the consequences for each:

Effects on Employees

Physical Health

A physically destructive effect of occupational stress is the nowadays widespread headaches, fatigue, gastrointestinal problems and muscular tension. Prolonged stress, in extreme cases, takes a toll on the overall human health and links to critical illnesses such as cardiovascular diseases, ramped-up blood pressure, and deterioration of the immune system that leads to increased vulnerability to diseases among the employees.

Mental Health

Stress has detrimental effects on physical and psychological well-being and it results to feelings of anxiety, depression, irritability, and mood swings. Extreme exhaustion and subsequent detachment and poor feelings about one's job are other possible consequences of this effect.

Job Performance

Stress is known to influence brain cognition and functionality in this regard, it hampers concentration, memory, and decision-making skills. This in turns results in reduced output, high rate of accidents, and general poor performance of duties. Also, stress wreaks havoc by increasing the incidences of absenteeism and presenteeism, in that some employees may be physically present at work but not productive.

Behavioural Changes

Stress, on the other hand, changes the behaviour of people whereby they may include changes in eating habits, sleeping habits, alcohol or drug habits, and become irritable or withdrawn. All these behaviours can amplify the stress levels in a person and bring about a chain of progressive deterioration of health and productivity.

Effects on Organizations

Decreased Productivity

Pressure at work negatively affects efficiency since employees are not able to concentrate on their duties, make more errors, and work slower. This can affect the total flow and productivity levels of the organization in one way or the other.

Higher Turnover Rates

Experienced occupational stress elevates turnover rate as stressed individuals always look for other employment opportunities. Such turnover can disrupt cohesion, send back knowledge out of the organization, elevate recruitment/training expenses.

Increased Absenteeism

Proliferation of stress related diseases is likely to contribute to increased incidences of employee absenteeism implying more sick leaves are likely to be given. This can add pressure to the other employees as well as causing inconvenience in the organization's productivity.

Lower Employee Morale

The work-related stress causes low morale and motivation in employees due to the unfavourable working conditions and environment. Unhappy and unmotivated employees lead to poor organizational climate which decreases cohesiveness and satisfaction in the workplace.

Signs and symptoms of Occupational Stress

Physical Symptoms

Headaches: Regular headaches, or migraines are one of the ways through which one can tell that they are stressed.

Fatigue: Fatigue, or chronic exhaustion that one cannot power through even after getting proper sleep.

Muscle Tension: Constrictions or discomfort and stiffness usually in the muscles of the neck, shoulder blades, and lower back.

Sleep Disturbances: Sleeping problems refer to the problems people encounter when they are trying to fall asleep, when they are asleep or even the quality of sleep they get.

Gastrointestinal Issues: Aches in the stomach, vomiting, loose movements or slow bowel movements.

Changes in Appetite: Consuming in excess or having little food in the tummy.

Emotional Symptoms

Anxiety: Ear pressure, ringing or popping, headache or migraine, dizziness or vertigo, nausea or vomiting, feeling nervous, restless or tense.

Depression: Depression, lack of motivation or discouragement for more that two weeks and anhedonia.

Irritability: More aggression, temper or temper tantrums.

Mood Swings: Flu, where the person experiences extreme swings in his or her affect or energy level.

Feelings of Overwhelm: Experiencing one's capacity to perform work-related tasks as overwhelming.

Cognitive Symptoms

Difficulty Concentrating: School and/or work problems: difficulties of concentrating and sustaining attention.

Memory Problems: A condition whereby a person cannot easily recall information even when it was learned in the recent past.

Poor Decision-Making: Being unsure as to which choice to make or often changing their mind about the decision that they have made.

Negative Thinking: Marked by negative thoughts, that significantly and unfairly dominate the individual and encompass irrational thoughts or excessive worrying.

Behavioural Symptoms

Changes in Eating Habits: even if it is occasional, which involves consuming large quantities of food than is usual or take smaller portions and opting for unhealthy foods.

Changes in Sleeping Habits: Getting inadequate amount of sleep, oversleeping, unsynchronized sleep schedule.

Social Withdrawal: Shunning people or staying away from work associates and other people.

Procrastination: Procrastination: It is characterized by putting off or omitting an activity even those which are significant.

Increased Substance Use: Disturbance in increased use of alcohol tobacco or any drug as an way of coping with stress.

Decreased Job Performance: Less output, higher error rates and missed deadlines, the list could go on.

Organizational Symptoms

Absenteeism: Frequent attendance to clinics or being on sick leave more often than usual.

Presenteeism: When you are at work, you are present but inactive, to some extent or even just half-baked.

Increased Conflict: More often, the tendency to argue not only with peers but also with superiors.

Low Morale: Low morale that is manifested in employees showing discontent or are unenthusiastic about their job.

High Turnover: The organization would be characterized by higher levels of attrition.

Occupational stress has emerged as a significant concern in contemporary workplaces, affecting individuals across various industries and organizational settings. Defined as the physical, mental, and emotional strain experienced by individuals due to pressures within the workplace, occupational stress poses a substantial threat to employee well-being, organizational productivity, and overall socio-economic development. Occupational stress has become a prevalent issue in today's fast-paced and demanding work environments.

It affects individuals across various professions, leading to negative consequences for both employees and organizations. The modern workplace is characterized by high demands, tight deadlines, competition, and technological advancements, all of which contribute to increased levels of stress among employees. Moreover, factors such as organizational restructuring, job insecurity, and work-life imbalance further impact stress levels. Left unaddressed, occupational stress can lead to adverse outcomes, including - decreased job satisfaction, impaired performance, absenteeism, turnover, and even physical and mental health issues. It affects individuals across various professions, leading to negative consequences for both employees and organizations.

As such, understanding the underlying causes, manifestations, and implications of occupational stress is paramount for effective management and mitigation strategies. Given the significant impact of occupational stress on individuals and organizations, there is a pressing need for empirical research to elucidate its underlying mechanisms and effects. By understanding the specific stressors encountered in different occupational settings, as well as individual and organizational factors that contribute to stress, researchers can develop targeted interventions to alleviate its detrimental effects and promote employee well-being and organizational effectiveness.

Interrelationship Between WRMSDs and Occupational Stress

It's a Two-Way Street, Occupational Stress and Work-Related Musculoskeletal Discomfort. Therefore, it is essential to analyse Work-Related Musculoskeletal Discomfort (WRMSD) and occupational stress in the context of how they influence one another, their processes of development and the effects that they bear on personnel and companies.

WRMSDs are painful disorders which affect muscles, tendons, nerves, and joints and have been determined or intensified by activities done at the workplace. They are a significant occupational health concern globally, affecting millions of workers across various industries. Similarly, occupational stress which is defined as stress originating from demands at work, organizational characteristic and perception of a householder is another malaise that affect health and organizational output of employees.

Stress at work and WRMSD directly interact as two sides of the same coin – they simultaneously worsen each other and affect employees' and employers' costs in equal measure. Let's delve into this complex relationship:

Physical Manifestations and Stress

Stress levels are also found to rise due to the bodily demands of WRMSDs. Main musculoskeletal disorders result in chronic pain and discomfort, which put an enormous mental pressure on employees due to restricted movement, limitations and difficulties in pains handling. Activities that a patient used to be able to perform independently may become tasks that frustrate her and cause her emotional stress. The cycle, which continues to feed physical pain back into to the cycle of psychological stress, makes it hard to disentangle the relationship between physical health and mental health in the workplace.

Stress-Induced Behavioural Changes (SIBCs) and WRMSDs

Stress that is related to work might affect behaviours that contribute to the development of WRMDs. For example, stressed employees may have poor postures, poor ergonomic practices or lack of rest in order to 'catch up' work. Such behavioural changes, despite being beneficial at first glance in managing WRMSDs' manifestations, can in fact lead to the worsening or onset of the WRMSDs in the long run. Owing to stress, tension in muscles is usually experienced and as such, physical injuries such as strains, sprains, and other musculoskeletal injuries may take place thus forming a loop between physical and emotional stress.

Organizational Context and Dual Burden

The organizational context plays a critical role in both WRMSDs and occupational stress. Poorly designed work environments, inadequate ergonomic assessments, and lack of preventive measures contribute to WRMSDs. Simultaneously, organizational factors such as high job demands, poor work-life balance, and ineffective communication channels contribute to heightened stress levels among employees. The dual burden of physical strain from WRMSDs and psychological strain from stressors in the workplace underscores the need for integrated approaches to occupational health and safety.

Need for the study:

Studying work-related musculoskeletal discomfort (WRMSD) and occupational stress in research is crucial for several reasons:

Health and Well-being: Work-related musculoskeletal disorders are among the most prevalent health problems affecting healthcare workers worldwide. They encompass a range of conditions affecting muscles, tendons, ligaments, nerves, and other soft tissues, often resulting from repetitive motions, awkward postures, or sustained exertion in the workplace. By studying these conditions, researchers can identify risk factors and develop preventive measures to protect workers' health and well-being.

Productivity and Performance: Work-related musculoskeletal discomfort and occupational stress can significantly impact productivity and job performance. Employees experiencing discomfort or stress may have reduced concentration, lower energy levels, and decreased efficiency in completing tasks. Understanding the factors contributing to these issues can help organizations implement strategies to improve working conditions and enhance productivity.

Costs to Organizations: Work-related musculoskeletal discomfort and occupational stress represent a significant financial burden for employers due to healthcare expenses, absenteeism, reduced productivity, and potential legal liabilities. By studying these issues, organizations can implement cost-effective interventions to mitigate risks and minimize the economic impact associated with workplace injuries and stress-related illnesses.

Employee Engagement and Retention: Addressing workplace hazards and promoting employee well-being can improve job satisfaction, engagement, and retention. Employees are more likely to stay with organizations that prioritize their health and safety and provide support to manage work-related stressors. Research in this area can guide employers in developing strategies to create a positive work environment conducive to employee satisfaction and retention.

Prevention and Intervention: Research can identify early warning signs of WRMSD and stress, allowing for preventive measures to be implemented before problems escalate. Additionally, research can inform the development of interventions to help workers cope with and manage these issues effectively.

Industry-Specific Considerations: Different industries may have unique challenges related to WRMSD and occupational stress. Research tailored to specific sectors can provide insights into industry-specific risk factors and effective interventions.

In summary, studying work-related musculoskeletal discomfort and occupational stress is essential for safeguarding the health and safety of workers, optimizing organizational performance, minimizing costs, and ensuring compliance with legal and regulatory requirements. Moreover, addressing these issues can foster a positive work culture that promotes employee well-being, engagement, and retention.

Aim

The aim of the study is to determine the rate of work- related musculoskeletal discomfort and occupational stress among the healthcare workers.

Objectives

1. To determine the rate of work - related musculoskeletal discomfort and occupational stress among the healthcare workers.
2. To identify the key factors contributing to the development of work-related musculoskeletal discomfort and occupational stress.
3. To suggest the recommendations to promote a healthier and more ergonomically sound work environment for healthcare workers, fostering long term well-being.

Review of Literature

Musculoskeletal disorders (MSDs) in the workplace have a huge impact, emerging as a growing problem in our modern societies; they represent the second largest cause of short-term or temporary work disability after the common cold. Work-related musculoskeletal disorders (WMSDs) are responsible for morbidity in many working populations and are known as an important occupational problem with increasing compensation and health costs, reduced productivity, and lower quality of life. WMSDs are characterized as multifactorial (Yasobant & Rajkumar, 2014). Work-related health problems result in an economic loss of 4-6% gross domestic product (GDP) for most countries. The term musculoskeletal disorder (MSD) encompasses a gamut of inflammatory and degenerative conditions that affect the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels with consequent ache, pain, or discomfort. Work-related musculoskeletal disorders (WMSDs) are defined as the musculoskeletal disorders that result from work-related events (Chandralekha, Joseph & Joseph, 2022, p. 178-182).

Work-related musculoskeletal disorders (WMSDs), which are problems of musculoskeletal system, are significant in the aspect that they affect occupational health and the careers of the working population leading to abstention from work, loss of productivity with financial and economic implications. The term 'musculoskeletal disorders (MSD)' refer to conditions that involve the nerves, tendons, muscles and supporting structures of the body. When a specific job plays the main causative factor, the term becomes work-related musculoskeletal disorders (WMSDs) (Sankar et al., 2012).

These ultimately cause decreased productivity, increased stress and poor sleep quality. This also leads to increased Disability- Adjusted Life Years (DALYs) and a high economic burden to the individual and society. Musculoskeletal Disorders (MSDs) are known to be multifactorial. They can be attributed to personal characteristics (prior medical history, physical capacity, aging, smoking, obesity, etc.) or work-related attributes (high work demand, lack of control over work, low job satisfaction, repetitive work, the high pace of work, time pressure, lack of support and physical exposure like lifting, carrying, pulling, pushing, repetition of movements, awkward or cramped position and static posture, prolonged standing, and sitting, etc.) .The World Health Organization (WHO) estimates that there are 1.71 billion MSD patients globally (Mahajan et al., 2023).

Stress is any action that places special physical or psychological demands upon a person, anything that can unbalance his individual equilibrium (Kushal et al., 2018).

Stress is any action that places special psychological or physical demands upon a person, anything that can unbalance his or her individual equilibrium (Fugelli, 1987). Work-related stress is a potential cause of concern in health care workers and is associated with decreased job satisfaction, days off work, anxiety, depression, sleeplessness, medical errors, and near misses (Kushal et al., 2018). Decreased job satisfaction inevitably results in negative results and in negative attitudes toward one's work, family, and ultimately, self (Gabbard & Menninger, 1988; Notman, 2000; Gautam, 2000). Chronic overstress is often stated as burnout (Maslach & Leither, 1997). Emotional illnesses can lead to anxiety disorders, addictions, depression, eating disorders, and suicide (Myers, 2000; Cromie, 2005).

Work-related musculoskeletal discomfort (WRMSD) encompasses a range of conditions affecting muscles, nerves, tendons, joints, cartilage, and spinal discs. These conditions are prevalent among workers and are associated with substantial personal and economic costs. This literature review examines the extensive body of research on WRMSD, focusing on its epidemiology, risk factors, impact, and strategies for prevention and management.

Historical Context and Evolution of WRMSD Research

The study of WRMSD has a rich historical context, evolving significantly over the decades. Early recognition of musculoskeletal disorders (MSDs) dates back to the industrial revolution, where the advent of mechanized labour brought about new health challenges. However, systematic research into WRMSD began more prominently in the mid-20th century.

Early Recognition and Industrial Era: The industrial revolution marked the beginning of significant interest in occupational health, including WRMSD. Repetitive strain injuries (RSIs) were first noted among telegraph operators and later in assembly line workers. The focus was initially on identifying obvious physical hazards and addressing them through basic ergonomic interventions.

Post-World War II Developments: The post-World War II era saw a surge in research on occupational health, driven by the growing complexity of industrial tasks and the increasing

prevalence of chronic musculoskeletal conditions. Studies during this period primarily focused on the physical demands of work and the development of basic ergonomic principles.

1970s-1980s: Establishment of Theoretical Models: The 1970s and 1980s were pivotal decades for WRMSD research, marked by the development of several influential theoretical models. For instance, the Cumulative Trauma Disorders (CTD) model by Armstrong et al. (1984) emphasized the role of repetitive stress in MSDs. Additionally, Karasek's Job Demand-Control model (1979) introduced the interaction between job demands and worker control, which has implications for understanding stress-related musculoskeletal issues.

1990s: Expanding Scope: During the 1990s, the scope of WRMSD research expanded to include psychosocial factors, reflecting a broader understanding of the multifactorial nature of these disorders. The biopsychosocial model became prominent, integrating physical, psychological, and social dimensions in the study of WRMSD.

2000s-Present: Technological and Organizational Factors: In the 21st century, the advent of new technologies and changing organizational structures have further shaped WRMSD research. There is an increasing focus on the role of technology in both exacerbating and mitigating WRMSD, as well as the impact of organizational culture and work design. Recent studies emphasize the importance of holistic approaches that consider ergonomic, psychosocial, and individual factors in prevention and management strategies.

Epidemiology of WRMSD

Understanding the epidemiology of WRMSD is crucial for identifying at-risk populations and developing targeted interventions. Epidemiological studies provide insights into the prevalence, incidence, and distribution of WRMSD across different occupational settings and demographic groups.

Prevalence and Incidence: WRMSD is one of the most prevalent occupational health issues globally. Studies indicate high prevalence rates across various sectors. For instance, healthcare workers, particularly nurses, report high rates of back and shoulder pain due to patient handling tasks (Smith et al., 2006). Similarly, office workers frequently experience neck and upper limb discomfort associated with prolonged computer use (Jensen et al., 2002).

Demographic Factors: Age, gender, and occupational tenure significantly influence the prevalence of WRMSD. Older workers are more susceptible to chronic musculoskeletal

conditions due to cumulative exposure to risk factors and age-related degeneration (Cimmino et al., 2011). Gender differences are also notable, with women generally reporting higher rates of WRMSD. This disparity may be attributed to differences in job roles, ergonomic conditions, and physical demands (Punnett & Herbert, 2000).

Occupational Variations: The prevalence of WRMSD varies significantly across different occupations. Manual labourers, including construction workers and agricultural labourers, are at high risk due to heavy physical demands and awkward postures. Conversely, office workers and those in sedentary jobs are prone to WRMSD due to prolonged static postures and repetitive tasks.

Regional Differences: Epidemiological patterns of WRMSD also show regional variations, influenced by factors such as industrialization, labour practices, and healthcare systems. For example, WRMSD prevalence is generally higher in industrialized nations due to the nature of work and reporting practices (Punnett & Wegman, 2004).

Risk Factors for WRMSD

Identifying and understanding the various risk factors for WRMSD is essential for developing effective prevention strategies. These risk factors can be broadly categorized into physical, ergonomic, psychosocial, and individual factors.

Physical Factors:

Repetitive Motions: Repeated movements, especially when performed at high speed or with insufficient recovery time, can lead to overuse injuries and musculoskeletal discomfort (Buckle & Devereux, 2002).

Forceful Exertions: Tasks that require significant physical effort, such as lifting heavy objects or applying force, increase the risk of WRMSD, particularly in the back and shoulders (Marras et al., 1993).

Awkward Postures: Working in non-neutral postures, such as bending, twisting, or reaching, places additional strain on the musculoskeletal system and is a major risk factor for WRMSD (Punnett & Wegman, 2004).

Ergonomic Factors:

Poor Workstation Design: Inadequate workstation setup, such as non-adjustable chairs and poorly placed monitors, can lead to poor posture and increased risk of WRMSD (Hignett, 2003).

Inadequate Tools and Equipment: Using tools that are not ergonomically designed can result in awkward hand positions and excessive force, contributing to musculoskeletal discomfort (Karsh et al., 2001).

Psychosocial Factors:

High Job Demands: Work environments with high workload and pressure can lead to increased stress, which is associated with higher rates of musculoskeletal discomfort (Bongers et al., 2006).

Low Job Control: Lack of control over work tasks and environment can contribute to WRMSD, as it is often linked with higher stress levels and lower job satisfaction (Karasek & Theorell, 1990).

Lack of Social Support: Poor social support from colleagues and supervisors can exacerbate the effects of physical and psychosocial stressors, increasing the risk of WRMSD (Bongers et al., 2006).

Individual Factors:

Personal Health and Fitness: Poor physical fitness and existing health conditions, such as obesity and previous injuries, can increase susceptibility to WRMSD (Waddell & Burton, 2001).

Age and Gender: Older workers and females tend to report higher rates of musculoskeletal discomfort. This may be due to physiological differences and gender-specific job roles and responsibilities (Cimmino et al., 2011; Punnett & Herbert, 2000).

Impact of WRMSD

The impact of work-related musculoskeletal discomfort (WRMSD) extends beyond individual health, affecting various aspects of society, the economy, and organizational functioning. This section delves into the multifaceted consequences of WRMSD, highlighting its profound implications.

Individual Health and Well-being:

Physical Health: WRMSD can lead to chronic pain, reduced mobility, and functional impairment. Conditions such as carpal tunnel syndrome, tendonitis, and lower back pain can severely limit an individual's ability to perform daily activities and work-related tasks (Woolf & Pfleger, 2003).

Mental Health: Chronic pain associated with WRMSD often results in psychological distress, including anxiety, depression, and reduced quality of life. The persistent discomfort and limitations can exacerbate mental health issues, creating a cycle of physical and psychological suffering (Punnett et al., 2009).

Economic Costs:

Healthcare Expenses: The treatment and management of WRMSD incur significant healthcare costs, including medical consultations, physical therapy, medications, and, in severe cases, surgical interventions. These expenses contribute to the overall economic burden on the healthcare system (Leigh et al., 1997).

Lost Productivity: WRMSD leads to substantial productivity losses due to absenteeism (time off work) and presenteeism (reduced productivity while at work). Workers with WRMSD may take frequent sick leave or may not perform optimally when present, impacting overall productivity (Henderson et al., 2011).

Disability and Compensation: Severe cases of WRMSD can result in long-term disability, necessitating compensation and disability benefits. This places a financial strain on social security systems and employers who bear the cost of worker's compensation claims (Silverstein et al., 1998).

Organizational Impact:

Increased Turnover: Workers suffering from WRMSD are more likely to leave their jobs, leading to higher turnover rates. This necessitates the recruitment and training of new employees, which can be costly and time-consuming for organizations (Faucett & Rempel, 1994).

Decreased Morale and Job Satisfaction: The presence of WRMSD in the workforce can reduce overall morale and job satisfaction. Workers experiencing pain and discomfort may

feel undervalued and unsupported, leading to decreased motivation and engagement (Lund et al., 2006).

Legal and Regulatory Compliance: Organizations face legal and regulatory obligations to ensure safe working conditions. Failure to address WRMSD can result in legal action, fines, and damage to the company's reputation. Compliance with occupational health and safety regulations requires investment in preventive measures and continuous monitoring (Punnett & Wegman, 2004).

Societal Impact:

Public Health Burden: WRMSD contributes to the overall burden of disease in society, affecting a significant portion of the working population. The widespread prevalence of these disorders underscores the need for public health interventions and policies to address occupational health risks (Woolf & Pfleger, 2003).

Quality of Life: The impact of WRMSD on individuals extends to their families and communities. Chronic pain and disability can affect family dynamics, social interactions, and participation in community activities. The ripple effect of WRMSD underscores its significance as a public health concern (Punnett et al., 2009).

Theoretical Models of WRMSD

Theoretical models provide frameworks for understanding the complex interplay of factors contributing to WRMSD. Several models have been developed to explain the mechanisms underlying these disorders, each offering unique insights.

Biomechanical Model: This model focuses on the physical forces exerted on the musculoskeletal system during work activities. It emphasizes the role of biomechanical stressors such as repetitive motions, forceful exertions, and awkward postures in the development of WRMSD (Marras et al., 1993). The biomechanical model is foundational in ergonomic assessments and interventions, guiding the design of tools and workstations to minimize physical strain.

Cumulative Trauma Model: Proposed by Armstrong et al. (1984), this model posits that WRMSD results from the accumulation of microtrauma over time due to repetitive stress and inadequate recovery. It highlights the importance of considering both the frequency and

intensity of occupational tasks, as well as the need for adequate rest and recovery periods to prevent chronic conditions.

Psychosocial Model: The psychosocial model, influenced by Karasek and Theorell's work (1990), emphasizes the role of psychosocial factors such as job demands, job control, and social support in the development of WRMSD. High job demands combined with low job control are associated with increased stress and musculoskeletal discomfort. This model underscores the need for a holistic approach to WRMSD prevention, incorporating both ergonomic and psychosocial interventions.

Biopsychosocial Model: This comprehensive model integrates physical, psychological, and social dimensions in the study of WRMSD. It recognizes that WRMSD is not solely a result of biomechanical factors but also influenced by individual perceptions, stress levels, and social context. The biopsychosocial model supports multidisciplinary approaches to WRMSD management, involving ergonomic, psychological, and organizational strategies (Waddell & Burton, 2001).

Prevention and Management of WRMSD

Effective prevention and management of WRMSD require a multifaceted approach that addresses various risk factors and promotes a healthy work environment. Several strategies have been developed and validated through research.

Ergonomic Interventions: Ergonomic interventions aim to optimize the design of workstations, tools, and tasks to reduce physical strain. This includes adjustable workstations, ergonomic chairs, and tools designed to minimize awkward postures and repetitive motions. Implementing ergonomic principles can significantly reduce the risk of WRMSD (Karsh et al., 2001). For example, redesigning tasks to eliminate excessive bending and lifting has been shown to reduce the incidence of back pain among healthcare workers (Nelson et al., 2006).

Behavioural Interventions: Training programs that promote safe work practices and proper body mechanics are crucial for preventing WRMSD. These programs educate workers on how to perform tasks safely, use ergonomic equipment effectively, and recognize early signs of musculoskeletal discomfort. Behavioural interventions have been shown to improve knowledge, attitudes, and behaviours related to WRMSD prevention (Verhagen et al., 2007).

Organizational Interventions: Organizational strategies involve modifying work schedules, reducing job demands, and enhancing job control to mitigate WRMSD. Flexible work schedules, job rotation, and reducing repetitive tasks can help prevent musculoskeletal discomfort. Additionally, fostering a supportive work environment and promoting a culture of health and safety are essential for successful WRMSD prevention (Bongers et al., 2006).

Individual Interventions: Exercise programs, physical therapy, and stress management techniques are effective in alleviating WRMSD symptoms. Regular physical activity can improve strength, flexibility, and overall musculoskeletal health, reducing the risk of injury. Physical therapy can provide targeted interventions for specific musculoskeletal issues, while stress management techniques help mitigate the impact of psychosocial stressors on WRMSD (Van den Heuvel et al., 2005).

Technological Innovations: The integration of technology in WRMSD prevention has gained traction in recent years. Wearable devices and sensor technology can monitor workers' posture and movement in real-time, providing feedback to correct ergonomic issues. Additionally, virtual reality (VR) and augmented reality (AR) applications are being explored for ergonomic training and risk assessment. These technological advancements hold promise for enhancing traditional WRMSD prevention strategies (Li et al., 2017).

Recent Trends in WRMSD Research and Management

The landscape of WRMSD research and management is continuously evolving, influenced by technological advancements, changing work environments, and emerging health challenges. Recent trends highlight the integration of innovative approaches to prevent and manage WRMSD effectively.

Technological Innovations:

Wearable Devices and Sensor Technology: Wearable devices equipped with sensors can monitor workers' posture, movements, and ergonomic risk factors in real-time. These devices provide immediate feedback to correct poor posture and reduce the risk of WRMSD. Research is ongoing to refine these technologies and integrate them into occupational health programs (Li et al., 2017).

Virtual Reality (VR) and Augmented Reality (AR): VR and AR technologies are being explored for ergonomic training and risk assessment. These immersive technologies can

simulate work environments and tasks, allowing workers to practice safe techniques and identify potential ergonomic issues before they occur (Darekar et al., 2021).

Remote Work and Telecommuting:

Impact of COVID-19: The COVID-19 pandemic has accelerated the adoption of remote work and telecommuting, presenting new challenges and opportunities for WRMSD management. The shift to home-based work environments has highlighted the need for ergonomic home office setups and the importance of promoting physical activity and regular breaks (Nguyen & Armoogum, 2021).

Ergonomic Interventions for Remote Workers: Research is focusing on developing and implementing ergonomic interventions tailored to remote workers. This includes guidelines for home office ergonomics, virtual ergonomic assessments, and online training programs to promote healthy work habits (Dockrell et al., 2021).

Integrated Health Approaches:

Multidisciplinary Interventions: There is a growing recognition of the need for multidisciplinary approaches to WRMSD management. Integrating ergonomic, psychological, and organizational strategies can provide comprehensive solutions to address the multifactorial nature of WRMSD. Collaboration between occupational health professionals, ergonomists, psychologists, and management is essential for effective prevention and intervention (Waddell & Burton, 2001).

Holistic Health Programs: Holistic health programs that promote overall well-being, including physical fitness, mental health, and work-life balance, are gaining traction. These programs aim to reduce the risk of WRMSD by addressing both physical and psychosocial factors. Initiatives such as workplace wellness programs, stress management workshops, and fitness activities are being implemented to support worker health (Skarpsno et al., 2017).

Data-Driven Decision Making:

Big Data and Predictive Analytics: The use of big data and predictive analytics is emerging as a powerful tool for identifying WRMSD risk factors and developing targeted interventions. Analysing large datasets from diverse sources, including wearable devices, health records, and workplace assessments, can provide insights into patterns and trends, enabling proactive measures to prevent WRMSD (Chung et al., 2019).

Machine Learning and AI: Machine learning and artificial intelligence (AI) technologies are being applied to predict WRMSD risk and optimize ergonomic interventions. These technologies can analyse complex data, identify high-risk tasks and individuals, and recommend personalized interventions. The integration of AI in occupational health is an exciting area of ongoing research (Li et al., 2019).

Policy and Regulatory Developments:

Enhanced Occupational Health Standards: Policy and regulatory frameworks are evolving to address the growing recognition of WRMSD as a significant occupational health issue. Enhanced standards and guidelines are being developed to ensure safe work environments and promote ergonomic practices. Governments and organizations are increasingly focusing on compliance with these standards to protect worker health (OSHA, 2020).

Global Initiatives: International organizations, such as the World Health Organization (WHO) and the International Labour Organization (ILO), are promoting global initiatives to address WRMSD. These initiatives aim to raise awareness, develop standardized guidelines, and foster collaboration among countries to improve occupational health and safety worldwide (WHO, 2021).

Literature Review of Occupational Stress

Occupational stress refers to the psychological and physiological responses that arise when there is an imbalance between job demands and the resources available to meet those demands. It is a pervasive issue that can lead to significant health problems and reduced productivity. This review aims to synthesize the extensive body of research on occupational stress, focusing on its prevalence, causes, consequences, and interventions.

Historical Context and Evolution of Occupational Stress Research

The concept of occupational stress has evolved significantly over the past century, influenced by changes in the nature of work and advances in our understanding of human health and behaviour.

Early 20th Century: Industrialization and Labor Movements: The rapid industrialization in the early 20th century brought about significant changes in the workplace, including increased workload, mechanization, and poor working conditions. These changes led to the recognition of work-related stress and its impact on workers' health. Early labour movements

advocated for better working conditions and the establishment of labour laws to protect workers' health.

Mid-20th Century: Emergence of Stress Research: The mid-20th century marked the beginning of systematic research on stress. Hans Selye's seminal work on the General Adaptation Syndrome (GAS) in the 1930s laid the foundation for understanding the physiological responses to stress (Selye, 1956). During this period, researchers began to explore the relationship between work and stress, highlighting the adverse effects of job stress on physical and mental health.

1970s-1980s: Development of Theoretical Models: The 1970s and 1980s saw the development of several influential theoretical models of occupational stress. For example, Karasek's Job Demand-Control model (1979) emphasized the interaction between job demands and job control, proposing that high demands combined with low control lead to stress. Siegrist's Effort-Reward Imbalance model (1996) highlighted the importance of the balance between the efforts put into work and the rewards received.

1990s-Present: Expanding Scope and Multidisciplinary Approaches: Since the 1990s, the scope of occupational stress research has expanded to include various factors such as organizational culture, work-life balance, and individual differences. Multidisciplinary approaches integrating psychology, sociology, and organizational behaviour have enriched our understanding of occupational stress and its management. The rise of technology and the changing nature of work have also introduced new stressors and challenges.

Epidemiology of Occupational Stress

Prevalence and Distribution

Occupational stress is a widespread phenomenon affecting workers globally across various sectors. Epidemiological studies provide insights into the prevalence rates and distribution patterns of stress among different populations.

Overall Prevalence: Studies consistently indicate that a significant proportion of the global workforce experiences occupational stress. For instance, surveys conducted by the American Psychological Association (APA) and other organizations suggest that a majority of workers report experiencing stress related to their jobs (APA, 2017). The prevalence rates vary across countries and industries but generally highlight the pervasive nature of the issue.

Sector-Specific Variations: Certain industries are particularly prone to high levels of occupational stress. Healthcare, for example, stands out due to the demanding nature of the work, exposure to life-and-death situations, long hours, and emotional strain (Shanafelt et al., 2015). High-stress professions such as law enforcement, emergency services, and finance also report elevated stress levels due to the inherent pressures and responsibilities associated with these roles.

Demographic Factors: Epidemiological research underscores the influence of demographic variables such as age, gender, and socioeconomic status on the prevalence of occupational stress. Younger workers may experience stress related to career development and job insecurity, while older workers face stress from changing job roles and health concerns (Gignac et al., 2000). Gender differences also play a role, with women often reporting higher stress levels related to work-life balance and caregiving responsibilities (Nelson & Burke, 2002).

Global and Cultural Variations: The epidemiology of occupational stress exhibits variations across different countries and cultural contexts. Economic conditions, labor practices, and societal attitudes toward work influence the prevalence and perception of stress. Cross-cultural studies highlight how cultural norms and values shape individuals' responses to workplace stressors and affect the prevalence rates observed (Cooper et al., 2001).

Factors Contributing to Variation

Several factors contribute to the variation in occupational stress prevalence and distribution:

Job Characteristics: The nature of job demands and control significantly influences stress levels. Jobs with high demands, such as heavy workloads, tight deadlines, and conflicting responsibilities, increase stress. Conversely, jobs that offer high levels of autonomy and decision-making authority can mitigate stress by providing employees with greater control over their work environment (Karasek, 1979).

Organizational Factors: Organizational practices and policies play a crucial role in shaping the stress experienced by employees. Factors such as organizational culture, management styles, support systems, and communication channels impact stress levels. A supportive work

environment that values employee well-being, provides adequate resources, and promotes work-life balance can reduce stress and enhance resilience (Schein, 1992).

Individual Differences: Personal characteristics and coping strategies influence how individuals perceive and respond to stressors. Personality traits, such as resilience, optimism, and emotional intelligence, can buffer the impact of stress. Conversely, individuals with predispositions like high neuroticism or poor coping skills may be more susceptible to stress-related health issues (Lazarus & Folkman, 1984).

External Pressures: External factors such as economic instability, technological advancements, and societal expectations contribute to occupational stress. Economic downturns, for example, may increase job insecurity and financial stress among workers. Technological advancements, while beneficial in many ways, can also introduce new stressors related to job automation, digital overload, and blurred boundaries between work and personal life (Oakman et al., 2020).

Implications for Public Health and Policy

Understanding the epidemiology of occupational stress has significant implications for public health initiatives and policy development:

Health Promotion: Public health strategies aimed at promoting workplace health and well-being can benefit from epidemiological insights into occupational stress. Targeted interventions that address specific industries, demographic groups, and risk factors can help mitigate the adverse health effects associated with stress. Health promotion programs may include stress management workshops, mental health screenings, and ergonomic assessments to improve working conditions (Sauter et al., 1990).

Policy Interventions: Policymakers can use epidemiological data to inform regulatory frameworks and occupational health standards. Implementing policies that prioritize worker safety, fair labour practices, and support for mental health can create healthier work environments and reduce stress-related illnesses and injuries. International organizations such as the World Health Organization (WHO) and the International Labour Organization (ILO) advocate for evidence-based policies that address occupational stress as part of broader efforts to promote global health and well-being (WHO, 2010).

Research and Surveillance: Continued research and surveillance efforts are essential for monitoring trends in occupational stress and identifying emerging issues. Longitudinal studies and cross-sectional surveys can track changes in stress prevalence, evaluate the effectiveness of interventions, and inform best practices in occupational health management. Collaborative research initiatives that involve academia, industry, and government agencies contribute to advancing knowledge and developing innovative solutions to mitigate occupational stress (Houdmont & Leka, 2010).

Theoretical Models of Occupational Stress

Theoretical models provide frameworks for understanding the mechanisms and factors that contribute to occupational stress.

Job Demand-Control Model (Karasek, 1979): This model posits that job stress arises from the interaction between job demands and job control. High job demands combined with low control lead to high stress, while high demands with high control result in active learning and personal growth. This model emphasizes the importance of job design and employee autonomy in managing stress.

Effort-Reward Imbalance Model (Siegrist, 1996): Siegrist's model highlights the importance of the balance between the efforts workers put into their jobs and the rewards they receive. An imbalance, where high efforts are not matched by adequate rewards (such as salary, recognition, and career opportunities), leads to stress. This model underscores the significance of fair compensation and recognition in preventing stress.

Person-Environment Fit Model (Edwards & Van Harrison, 1993): This model suggests that stress occurs when there is a misfit between the individual's abilities, needs, and values, and the demands, resources, and rewards provided by the environment. A good fit reduces stress and enhances well-being, while a poor fit leads to stress and dissatisfaction. This model highlights the importance of matching individuals to suitable job roles and environments.

Transactional Model of Stress and Coping (Lazarus & Folkman, 1984): Lazarus and Folkman's model emphasizes the cognitive appraisal process in understanding stress. According to this model, stress arises from the individual's perception of a situation as challenging or threatening and their assessment of available coping resources. This model underscores the role of individual perceptions and coping strategies in managing stress.

Risk Factors for Occupational Stress

Identifying and understanding the various risk factors for occupational stress is crucial for developing effective prevention and management strategies. These risk factors can be broadly categorized into job-related, organizational, and individual factors.

Job-Related Factors:

High Job Demands: Excessive workload, tight deadlines, and high responsibility levels contribute to stress. Jobs with high physical, cognitive, or emotional demands are particularly stressful (Karasek, 1979).

Low Job Control: Lack of control over work tasks and decision-making processes increases stress. Jobs that offer limited autonomy and opportunities for decision-making are associated with higher stress levels (Sauter et al., 1990).

Role Ambiguity and Conflict: Unclear job roles and conflicting demands from different sources can lead to stress. Role ambiguity and conflict create uncertainty and confusion, increasing stress (Kahn et al., 1964).

Organizational Factors:

Poor Organizational Culture: An unsupportive and toxic organizational culture contributes to stress. Factors such as lack of support from supervisors and colleagues, poor communication, and unfair treatment exacerbate stress (Schein, 1992).

Inadequate Resources and Support: Insufficient resources, such as inadequate staffing, equipment, and training, increase stress. Lack of organizational support for dealing with job demands and stressors also contributes to higher stress levels (Karasek & Theorell, 1990).

Job Insecurity: Uncertainty about job stability and fear of job loss are significant stressors. Organizational changes, downsizing, and economic instability contribute to job insecurity and stress (De Witte, 1999).

Individual Factors:

Personality Traits: Certain personality traits, such as high levels of neuroticism, low self-esteem, and Type A behaviour, are associated with higher stress levels. Individuals with these

traits are more likely to perceive situations as stressful and have difficulty coping with stress (Lazarus & Folkman, 1984).

Coping Strategies: The ways in which individuals cope with stress significantly influence their stress levels. Adaptive coping strategies, such as problem-solving and seeking social support, reduce stress, while maladaptive strategies, such as avoidance and substance use, increase stress (Folkman & Moskowitz, 2004).

Work-Life Balance: Difficulties in balancing work and personal life contribute to stress. Factors such as long working hours, lack of flexibility, and family responsibilities create conflicts between work and personal life, leading to stress (Greenhaus & Beutell, 1985).

Impact of Occupational Stress

Occupational stress has profound effects not only on individual health but also on organizational outcomes and broader societal implications. This section explores these impacts in detail.

Impact on Individual Health:

Physical Health: Chronic exposure to occupational stress is linked to numerous physical health issues. Cardiovascular problems such as hypertension and heart disease are prevalent among stressed workers due to prolonged exposure to stress hormones like cortisol (Ganster & Rosen, 2013). Musculoskeletal disorders, including back pain and repetitive strain injuries, are also common as stress can lead to muscle tension and poor posture (Bernard, 1997). Additionally, stress can cause gastrointestinal problems, such as irritable bowel syndrome, and impair immune function, making individuals more susceptible to infections and illnesses (Cohen et al., 2007).

Mental Health: The psychological effects of occupational stress are significant. High stress levels can lead to anxiety disorders, depression, and burnout. Burnout, characterized by emotional exhaustion, depersonalization, and a sense of reduced personal accomplishment, is particularly prevalent in high-stress professions such as healthcare, education, and social services (Maslach et al., 2001). Chronic stress also contributes to cognitive impairments, including memory problems and difficulty concentrating, which further impact job performance (Lupien et al., 2009).

Impact on Organizational Outcomes:

Productivity and Performance: Occupational stress adversely affects productivity and performance. Stressed employees are more likely to experience fatigue, reduced motivation, and cognitive impairments, leading to decreased efficiency and higher error rates (Sparks et al., 2001). Presenteeism, where employees are physically present but mentally disengaged, is another consequence of stress, resulting in suboptimal work output.

Absenteeism and Turnover: High levels of stress contribute to increased absenteeism, as employees take time off to cope with stress-related health issues. Chronic stress also leads to higher turnover rates, as employees leave stressful jobs in search of better work environments. This turnover incurs significant costs for organizations, including recruitment, training, and lost productivity during the transition period (Michie & Williams, 2003).

Job Satisfaction and Morale: Occupational stress negatively impacts job satisfaction and morale. Employees experiencing high stress levels often report low job satisfaction, which can lead to decreased engagement and commitment to the organization. Poor morale and job dissatisfaction can create a negative work environment, further exacerbating stress and reducing overall organizational effectiveness (Faragher et al., 2005).

Workplace Safety: Stressed workers are more prone to accidents and injuries due to impaired concentration, fatigue, and risk-taking behaviours. This is particularly concerning in high-risk industries such as construction, manufacturing, and transportation, where safety is paramount. Ensuring a safe work environment requires addressing the underlying stressors that contribute to unsafe behaviours (Goldenhar et al., 2003).

Impact on Society:

Economic Costs: The economic burden of occupational stress is substantial, encompassing healthcare costs, lost productivity, and disability payments. Stress-related illnesses and injuries increase healthcare utilization, leading to higher medical expenses for individuals and employers. The productivity losses associated with absenteeism, presenteeism, and turnover also have significant economic implications (Leigh et al., 1997).

Public Health: Occupational stress is a public health concern due to its widespread prevalence and impact on population health. Addressing occupational stress through public health initiatives, workplace policies, and regulations can improve overall health outcomes

and reduce the burden on healthcare systems. Public health campaigns can raise awareness about the importance of stress management and promote healthy work environments (World Health Organization, 2010).

Social Well-being: The effects of occupational stress extend beyond the workplace, impacting social relationships and community well-being. Stressed individuals may experience strain in personal relationships, reduced social participation, and diminished quality of life. By promoting healthy work environments and supporting stress management, society can enhance social cohesion and overall well-being (Sauter et al., 1990).

Recent Trends in Occupational Stress Research and Management

Recent trends in occupational stress research and management reflect the evolving nature of work, technological advancements, and a growing recognition of the importance of mental health in the workplace. This section highlights these trends and their implications.

Technological Advancements:

Remote Work and Telecommuting: The COVID-19 pandemic has accelerated the adoption of remote work, presenting new challenges and opportunities for managing occupational stress. Remote work can reduce stress related to commuting and provide greater flexibility, but it also introduces stressors such as isolation, work-life balance issues, and technological difficulties. Organizations are developing strategies to support remote workers, including virtual wellness programs and flexible work arrangements (Oakman et al., 2020).

Digital Health Interventions: Technology-based interventions, such as mobile apps and online platforms, are increasingly used to manage occupational stress. These tools offer accessible resources for stress management, including mindfulness exercises, cognitive-behavioural therapy, and stress monitoring. Digital interventions can complement traditional approaches and provide scalable solutions for workplace stress (Heber et al., 2017).

Focus on Mental Health and Well-being:

Integrated Health Programs: Organizations are adopting holistic health programs that address physical, mental, and emotional well-being. These programs include initiatives such as wellness workshops, mental health days, and employee assistance programs (EAPs). By promoting overall well-being, organizations aim to reduce stress and improve employee resilience and productivity (Goetzel et al., 2014).

Mental Health Awareness: There is a growing emphasis on mental health awareness and destigmatization in the workplace. Initiatives to raise awareness about mental health issues, provide training for managers, and create supportive environments are becoming more common. These efforts aim to create a culture of openness and support, encouraging employees to seek help and engage in stress-reducing activities (Henderson et al., 2011).

Organizational Culture and Leadership:

Transformational Leadership: Transformational leadership, characterized by inspiring and supportive leadership practices, is increasingly recognized as a critical factor in reducing occupational stress. Leaders who engage with employees, provide clear communication, and foster a positive work environment can significantly reduce stress levels and enhance job satisfaction (Skakon et al., 2010).

Organizational Justice: Fairness and equity in organizational practices, known as organizational justice, play a crucial role in reducing stress. Ensuring fair treatment in terms of resource distribution, decision-making processes, and interpersonal interactions can mitigate stress and enhance employee well-being. Organizations are focusing on transparent and inclusive practices to promote a sense of justice and reduce stress (Greenberg, 2010).

Policy and Regulation:

Enhanced Occupational Health Standards: Regulatory bodies are increasingly recognizing the importance of addressing occupational stress through enhanced health and safety standards. Policies aimed at reducing work-related stress, such as limits on working hours, mandatory rest breaks, and ergonomic guidelines, are being implemented to protect worker health (European Agency for Safety and Health at Work, 2014).

Global Initiatives: International organizations, including the World Health Organization (WHO) and the International Labour Organization (ILO), are promoting global initiatives to address occupational stress. These initiatives aim to develop standardized guidelines, foster cross-country collaborations, and support research and policy development to improve workplace health and safety worldwide (WHO, 2010).

Research and Evidence-Based Practices:

Multidisciplinary Approaches: Contemporary research on occupational stress emphasizes the need for multidisciplinary approaches that integrate psychology, sociology, occupational

health, and organizational behavior. Collaborative research efforts aim to provide comprehensive insights into the complex nature of stress and develop effective interventions (Houdmont & Leka, 2010).

Data-Driven Decision Making: The use of big data and advanced analytics is becoming more prevalent in occupational stress research. By analyzing large datasets, researchers can identify patterns, predict risk factors, and develop targeted interventions. Data-driven approaches enable organizations to implement evidence-based practices and monitor the effectiveness of stress management programs (Chung et al., 2019).

Methodology

Study Design

A descriptive cross-sectional study design was adopted to investigate the prevalence and factors contributing to work-related musculoskeletal discomfort (WRMSD) and occupational stress among healthcare workers. This design allowed for the collection of data at a single point in time, providing a snapshot of the current situation regarding WRMSD and occupational stress within the specified population.

Study Location

The study was conducted in the Indian healthcare setup, over the course of one year. This setting provided a large and diverse workforce, extensive patient care activities, and the availability of various departments, specialties and representative sample of healthcare workers, encompassing various job roles and responsibilities, which was essential for a comprehensive analysis of WRMSD and occupational stress.

Study Duration

The study is planned to span one year, including the phases of preparation, data collection, and data analysis. The timeline is as follows:

- **Preparation Phase (5 months):** Development of the study protocol, ethical approvals, and development of the questionnaire.
- **Data Collection Phase (4 months):** Distribution and collection of questionnaires, and conducting interviews and observations.
- **Data Analysis Phase (2 months):** Data entry, statistical analysis, and interpretation of results.
- **Reporting Phase (1 month):** Writing and dissemination of findings through reports, publications, and presentations.

Sample Size and Population

The sample size for this study was determined to be 235 healthcare workers, including doctors, nurses, paramedical, and administrative staff. The questionnaires was distributed among 300 healthcare workers. Responses with missing answers were removed while

analysis. This sample size was calculated based on the expected prevalence rates of WRMSD and occupational stress and allowed for a sufficient level of statistical power to detect significant relationships between variables. This sample size allowed for meaningful subgroup analyses and ensured that the study results would be generalizable to the broader population of healthcare workers in similar settings.

Sample size calculation -

Sample Size for Frequency in a Population

Population size(for finite population correction factor or fpc)(*N*)	**:**	1000000
Hypothesized % frequency of outcome factor in the population (*p*)	**:**	81.2%+/-5
Confidence limits as % of 100(absolute +/- %)(*d*)	**:**	5%
Design effect (for cluster surveys-*DEFF*)	**:**	1

Sample Size(*n*) for Various Confidence Levels

Confidence Level(%)	Sample Size
95%	235
80%	101
90%	166
97%	288
99%	405
99.9%	661
99.99%	924

Equation

Sample size *n* = [DEFF*Np(1-p)]/ [(d^2/Z$^2_{1-\alpha/2}$*(N-1)+p*(1-p)]

Results for sample size calculations were derived using OpenEpi, Version 3 software.

Inclusion and Exclusion Criteria

Inclusion Criteria:

- Employment Status: Participants must be currently employed at a healthcare set-up.
- Job Role: The study included a wide range of healthcare workers, including doctors, nurses, technicians, and support staff.
- Work Experience: Participants were required to have at least six months of work experience at the hospital to ensure familiarity with the work environment and potential exposure to WRMSD and occupational stress.
- Age: Participants aged 18 to 65 years were eligible for the study.
- Willingness to Participate: Participants had to provide informed consent indicating their willingness to participate in the study.

Exclusion Criteria:

- Age: Those who did not meet the age or experience requirements.
- Recent Major Surgery or Injury: Participants who had undergone major surgery or experienced a significant injury in the past six months were excluded to avoid confounding the results with acute conditions unrelated to their work.
- Severe Psychiatric Conditions: Participants with diagnosed severe psychiatric conditions that could impair their ability to respond accurately to the questionnaire were excluded.
- Consent: Individuals who refused to participate.
- Pre-existing conditions: Those with pre-existing musculoskeletal and stress conditions not related to work.

Data Collection

Data were collected using a structured questionnaire developed specifically for this study. The questionnaire was distributed to the healthcare workers, who were asked to complete it voluntarily. The completed questionnaires were then collected and analysed by the researcher. To ensure a high response rate, the questionnaire was converted into the google form, reminders were sent, and data collection was done in coordination with the department heads to facilitate participation.

Questionnaire Development

Development Process:

The questionnaire was developed following a thorough review of existing literature on work-related musculoskeletal discomfort and occupational stress. Nordic Musculoskeletal Questionnaire (NMQ) was referred for the questions related to WRMSD and Occupational Stress Index (OSI) was considered for adding question related to occupational stress. Key themes and variables identified in the literature informed the construction of the questionnaire items. The questionnaire was designed to capture comprehensive data on the physical, mental, and social aspects of occupational health. The development process involved several critical stages, including literature review, expert consultations, pilot testing, and validation. Here's an elaboration of the question development process:

Literature Review

The initial step in the development of the questionnaire involved a thorough review of existing literature on WRMSD and occupational stress. This review aimed to identify common themes, risk factors, and impacts associated with these conditions. The insights gained from the literature helped in formulating relevant and comprehensive questions.

Expert Consultations

Following the literature review, a panel of experts, including occupational health specialists, ergonomists, clinical psychologists, and experienced healthcare workers, were consulted. The panel provided valuable input on the relevance, clarity, comprehensiveness and representativeness of the questions. Their feedback was instrumental in refining the questionnaire items to ensure they accurately captured the constructs of interest. They reviewed each and every question thoroughly and gave suggestions for improvement.

Content Validation

The questionnaire underwent a content validation process to ensure it covered all relevant aspects of WRMSD and occupational stress. The expert panel reviewed the revised questionnaire and provided further suggestions for improvement. This iterative process of feedback and refinement continued until the questionnaire was deemed comprehensive and clear.

Translation and Cultural Adaptation

The final version of the questionnaire was translated into Hindi to ensure accessibility for all participants. The translation process involved forward and backward translation by bilingual experts. This process ensured that the translated version retained the meaning and context of the original questions. Cultural adaptation was also considered to ensure the questions were appropriate and relevant to the local context.

Correlation Testing

Correlation Testing was used for the validation of the developed questionnaire. Questionnaire validation is a critical step in research to ensure the accuracy and reliability of the developed questionnaire. One of the techniques used for validation is correlation testing. This statistical method assesses the strength and direction of the relationship between variables within the questionnaire, providing insights into the internal consistency and construct validity of the instrument.

Purpose of Correlation Testing

- Internal Consistency: Ensures that the items within a questionnaire are measuring the same underlying construct.
- Construct Validity: Assesses whether the questionnaire accurately measures the theoretical construct it intends to measure.
- Reliability: Verifies the consistency of the questionnaire results over time or across different samples.
- Reduction of Bias: Helps identify and eliminate items that do not correlate well with others, reducing potential biases.

Correlation testing is a fundamental part of questionnaire validation. By identifying the relationships between items, researchers can ensure that their instruments are both reliable and valid, ultimately leading to more accurate and meaningful research findings.

- If the p-value is less than alpha-value means level of significance i.e., $p<0.05$, then it is statistically significant and the question is valid.
- If the p-value is greater than alpha-value means level of significance i.e., $p>0.05$, then it is statistically insignificant and the question is not valid.

- If the calculated value is greater than tabulated/critical value then it indicates that the question is valid.

As a result of this procedure 5 questions were eliminated due to the lack in relevance and representativeness and then improvements were made in the questionnaire.

REMOVED QUESTIONS

1. Question related to WRMSD - Do you drive to your work?
2. Question related to Work environment - I face distractions due to loud noises in my workplace.
3. Question related to Job satisfaction - I am experiencing career advancement which keeps me satisfied in my job.
4. Question related to Psychosomatic symptoms –
   Biting nails
5. Question related to Psychosomatic symptoms –
   lack of concentration

Response Format:

A Likert scale was employed to measure responses, allowing participants to indicate the frequency or intensity of their experiences. The scale range was-

Never - 1

Rarely - 2

Sometimes - 3

Often - 4

Always - 5

providing a nuanced understanding of the prevalence and severity of WRMSD and occupational stress. This format allows for the quantification of attitudes, perceptions, and experiences related to WRMD and occupational stress.

Questionnaire Structure:

The questionnaire was divided into four main sections, each focusing on a different aspect of WRMSD and occupational health:

Section A: Demographic Details

Objective: To collect basic demographic information of the participants.

Questions: Age, gender, job role, years of experience, educational qualifications, department, marital status, working hours per week, physical activity, habits (tobacco and alcohol use), and time to reach workplace.

These variables were crucial for characterizing the sample and analysing potential demographic differences in WRMSD and occupational stress.

Section B: Work-related Musculoskeletal Discomfort

Objective: To assess the presence, frequency, and severity of musculoskeletal discomfort in various body regions.

This section included questions about the presence, frequency, and severity of musculoskeletal discomfort in various body regions. Questions also assessed the impact of this discomfort on work performance and daily activities.

Section C: Occupational Stress

Objective: To evaluate different dimensions of occupational stress. Questions in this section evaluated different dimensions of occupational stress, including workload, control over work, work-life balance, physical and emotional well-being, and recognition and rewards.

Subsections and Questions:

- Workload and Time Pressure
- Control and Decision Making
- Work Environment
- Work Relations
- Job Satisfaction and Motivation
- Work-life Balance
- Physical and Emotional Well-being

Section D: Psychosomatic Symptoms

Objective: To assess the physical manifestations of psychological or emotional stress. Items included questions about the frequency and severity of symptoms such as Blurred vision,

excessive sweating, palpitations, difficulty in breathing, cold hands and feet, indigestion/constipation, stomach pain, nausea/vomiting, loss of appetite, increased appetite, headache, weight gain, weight loss, sleep disturbances, restlessness, lack of confidence. Participants were also asked about their coping strategies and the effectiveness of these strategies in managing stress.

Scoring System

Demographic Details (Section A)

- This section is for contextual understanding and does not contribute to the score.

Work-related Musculoskeletal Discomfort (Section B)

For binary questions – "No" answer: 0 points and if "Yes" answer: 1 point will be added.

- Each body part with pain is rated on a scale of 0-10.

- Calculate the average pain score for all reported body parts.

Physical Activity and Work-related Movements

- Each "Never" answer: 1 point

- Each "Rarely" answer: 2 points

- Each "Sometimes" answer: 2 points

- Each "Often" answer: 4 points

- Each "Always" answer: 5 points

- Sum the scores for a total physical activity and strain score.

Occupational Stress (Section C)

Workload and Time Pressure

- Same 1-5 scale as Section B.

- Sum the scores for a total workload and time pressure score.

Control and Decision Making

- Same 1-5 scale as Section B.

- Sum the scores for a total control and decision-making score.

Work Environment

- Same 1-5 scale as Section B.

- Sum the scores for a total work environment score.

Work Relations

- Same 1-5 scale as Section B.

- Sum the scores for a total work relations score.

Job Satisfaction and Motivation

- Same 1-5 scale as Section B.

- Sum the scores for a total job satisfaction and motivation score.

Work-life Balance

- Same 1-5 scale as Section B.

- Sum the scores for a total work-life balance score.

Physical and Emotional Well-being

- Same 1-5 scale as Section B.

- Sum the scores for a total physical and emotional well-being score.

Support and Resources

- Same 1-5 scale as Section B.

- Sum the scores for a total support and resources score.

Job Security

- Same 1-5 scale as Section B.

- Sum the scores for a total job security score.

Recognition and Reward

- Same 1-5 scale as Section B.

- Sum the scores for a total recognition and reward score.

Psychosomatic Symptoms (Section D)

- Same 1-5 scale as Section B.

- Sum the scores for a total psychosomatic symptoms score.

This scoring system provides a comprehensive and balanced approach to assessing occupational health while adhering to ethical standards.

Interpretation of the Scores

For WRMSD Scores:

Low (0-65)

Moderate (66-130)

High (131-195)

For Occupational Stress Scores:

Low (0-105)

Moderate (106-210)

High (210-310)

For Total Stress Score:

Low (0-170)

Moderate (171-340)

High (341-505)

Scorecard

S. No.	Section	Name of the section	Max Score	Individual Score	Percentage
1	B	Work related Musculoskeletal Discomfort	195	B	(B/195)*100%
2		Binary questions	40	a	(a/40)*100%
3		Pain scale question	100	b	(b/100)*100%
4		Physical activity questions	55	c	(c/55)*100%
5	C	Occupational Stress	310	C	(C/310)*100%
6		Workload and Time Pressure	40	a	(a/40)*100%
7		Control and Decision Making	25	b	(b/25)*100%
8		Work Environment	15	c	(c/15)*100%
9		Work relations	20	d	(d/20)*100%
10		Job Satisfaction and Motivation	20	e	(e/20)*100%
11		Work-life Balance	20	f	(f/20)*100%
12		Physical and Emotional Well-being	25	g	(g/25)*100%
13		Support and Resources	20	h	(h/20)*100%
14		Job Security	20	i	(i/20)*100%
15		Recognition and Reward	25	j	(j/25)*100%
16	D	Psychosomatic Symptoms	80	D	(D/80)*100%
		TOTAL	505	E	(E/505)*100%

Table 1 : Scorecard for Occupational Health Questionnaire

Following the development and finalization of the questionnaire, it was submitted for copyright registration to ensure legal protection of the intellectual property. The copyright registration process was completed successfully, securing all rights and protections under applicable copyright laws.

Data Sources

Data were collected through a combination of self-reported questionnaires and direct observations by the researcher. This mixed-methods approach provided a comprehensive understanding of the prevalence and factors contributing to WRMSD and occupational stress.

The primary data sources for this study were the responses collected from the Occupational Health Questionnaire. This questionnaire was designed to gather comprehensive information on demographic details, work-related musculoskeletal discomfort (WRMSD), occupational stress, and psychosomatic symptoms among healthcare workers. Additional data sources included:

Institutional Records: Information on the healthcare workers' roles, departments, and years of service was obtained from the hospital's administrative records to verify the accuracy of self-reported data and provide context for the analysis.

Medical Records: For participants who reported seeking medical attention for musculoskeletal discomfort, relevant medical records were reviewed (with consent) to confirm diagnoses and treatments received.

Data Analysis

Data were analysed using SPSS statistical software. Descriptive statistics were used to summarize the demographic characteristics of the sample and the rate of WRMSD and occupational stress. Inferential statistics, such as chi-square tests and regression analyses, were employed to examine relationships between variables and identify significant predictors of WRMSD and occupational stress.

The data analysis process involved several steps, including data entry, cleaning, descriptive statistics, inferential statistics, and advanced statistical modelling. The analysis was performed using SPSS software version 25.0. Here is a detailed breakdown of each step:

Data Entry and Cleaning

Data Cleaning: The data were checked for accuracy and completeness. Inconsistent responses, missing data, and outliers were identified and addressed. Missing data were handled using appropriate statistical methods, such as multiple imputation or mean substitution, depending on the nature and extent of the missing values. Incomplete questionnaires were excluded from the analysis, and logical checks were performed to ensure data accuracy.

Data Entry: Responses from questionnaires and Google Forms were converted into an Excel sheet, which was then entered into the SPSS database. Each questionnaire was assigned a unique identifier to maintain confidentiality while linking demographic information with responses.

Descriptive Statistics

Demographic Analysis: Frequencies and percentages were calculated for categorical variables (e.g., gender, job role, department), while means and standard deviations were calculated for continuous variables (e.g., age, years of experience).

Rate of WRMSD and Occupational Stress: The rate of WRMSD in different body regions and the overall prevalence of occupational stress were calculated. This included the percentage of participants reporting discomfort or stress and the mean severity scores.

Psychosomatic Symptoms: The frequency and distribution of reported psychosomatic symptoms were analysed to identify common patterns and their association with WRMSD and occupational stress.

Inferential Statistics

Correlation Analysis: Pearson's or Spearman's correlation coefficients were used to examine the relationships between demographic variables, WRMSD, occupational stress, and psychosomatic symptoms. This helped identify potential factors contributing to WRMSD and stress.

Group Comparisons: Independent t-tests or Mann-Whitney U tests were conducted to compare the levels of WRMSD and occupational stress between different groups (e.g., gender, job roles).

Factor Analysis: Exploratory and confirmatory factor analyses were conducted to validate the constructs measured by the questionnaire. This ensured that the items in each section of the questionnaire reliably measured the intended constructs (e.g., different dimensions of occupational stress).

Data Interpretation

Identifying Key Factors: The results from the statistical analyses were interpreted to identify key factors associated with WRMSD and occupational stress. These included demographic factors, work-related factors, and psychosomatic symptoms.

Comparing with Literature: Findings were compared with existing literature to contextualize the results and highlight similarities or discrepancies with previous studies. This comparison helped in understanding the unique aspects of the study population and setting.

Implications for Practice: The practical implications of the findings were discussed, particularly in terms of developing interventions to reduce WRMSD and occupational stress among healthcare workers. Recommendations were made for hospital management and policymakers based on the identified risk factors and protective factors.

Limitations and Future Research: The limitations of the study were acknowledged, and suggestions for future research were provided. This included recommendations for longitudinal studies to assess changes over time and the need for intervention studies to test the effectiveness of proposed solutions.

Ethical Considerations

Ethical approval for this study was obtained from the Institutional Review Board (IRB) of Santosh Medical College and Hospital. All data collected were kept confidential and used solely for the purposes of this research. Participants' anonymity was ensured by assigning unique identifiers to their responses, and all data were stored securely.

Informed Consent

Informed consent is a fundamental ethical requirement in research. All participants were provided with detailed information about the study's objectives, procedures, potential risks, and benefits. This information was presented in a clear and understandable manner, both in

written and verbal forms. Participants were informed that their participation was voluntary, and they had the right to withdraw from the study at any time without any consequences. A consent form was signed by each participant before they took part in the study, ensuring that they fully understood the study and agreed to participate.

Voluntary Participation

Participation in this study was entirely voluntary. Healthcare workers who chose not to participate or who withdrew from the study did not face any negative consequences. Efforts were made to ensure that participants felt comfortable and supported throughout the study process.

Confidentiality and Anonymity

Maintaining the confidentiality and anonymity of participants was a priority. Participants' personal information, such as names and contact details, was not linked to their responses. Instead, unique identification codes were used to anonymize the data. All data were stored securely, with access restricted to authorized research team members. Digital data were password-protected, and physical documents were kept in locked cabinets. The collected data will be retained for a period of five years following the completion of the study and then securely destroyed in accordance with institutional data retention policies.

Minimizing Risk and Discomfort

The study was designed to minimize any potential risks or discomfort to participants. The questionnaire was carefully crafted to avoid intrusive or sensitive questions that might cause distress. Participants were assured that they could skip any questions they were uncomfortable answering. Additionally, the study procedures were designed to be as non-disruptive as possible to the participants' daily routines.

Respect for Participants' Rights and Dignity

Respect for participants' rights and dignity was upheld throughout the study. Participants were treated with respect and courtesy at all times. Their autonomy was respected by ensuring they had full control over their decision to participate and their ability to withdraw from the study. The research team was trained to handle participants' queries and concerns with sensitivity and professionalism.

Debriefing

At the conclusion of their participation, participants were provided with a debriefing session where they were informed about the study's objectives in more detail and how their data would contribute to the research outcomes. Participants were also given the opportunity to ask any questions they had about the study. This debriefing process ensured transparency and helped participants understand the significance of their contribution to the research.

Ethical Approval

Ethical Approval: Ethical approval for the study has been obtained from the Institutional Ethics Committee (IEC) (Lr. No. : F. No. SU/R/2024/1344[35]) of Santosh Deemed to be University, Ghaziabad, UP before starting.

Transparency and Accountability

Transparency and accountability were maintained throughout the study. Any potential conflicts of interest were disclosed, and the study's funding sources were clearly stated. Regular updates on the study's progress were provided to the IRB, and any unexpected issues or deviations from the protocol were reported promptly. This ensured that the study remained aligned with ethical guidelines and institutional requirements.

Benefits to Participants and the Community

The study aimed to provide benefits to both the participants and the broader community. Participants gained insight into their own occupational health, which could inform their personal health management strategies. Additionally, the findings of the study were intended to inform institutional policies and practices, potentially leading to improved working conditions and health outcomes for healthcare workers in the future.

Limitations

Potential limitations of this study included the reliance on self-reported data, which may be subject to response bias. Additionally, the cross-sectional design limited the ability to establish causal relationships between variables. Despite these limitations, this study provided valuable insights into the prevalence and factors contributing to WRMSD and occupational stress among healthcare workers.

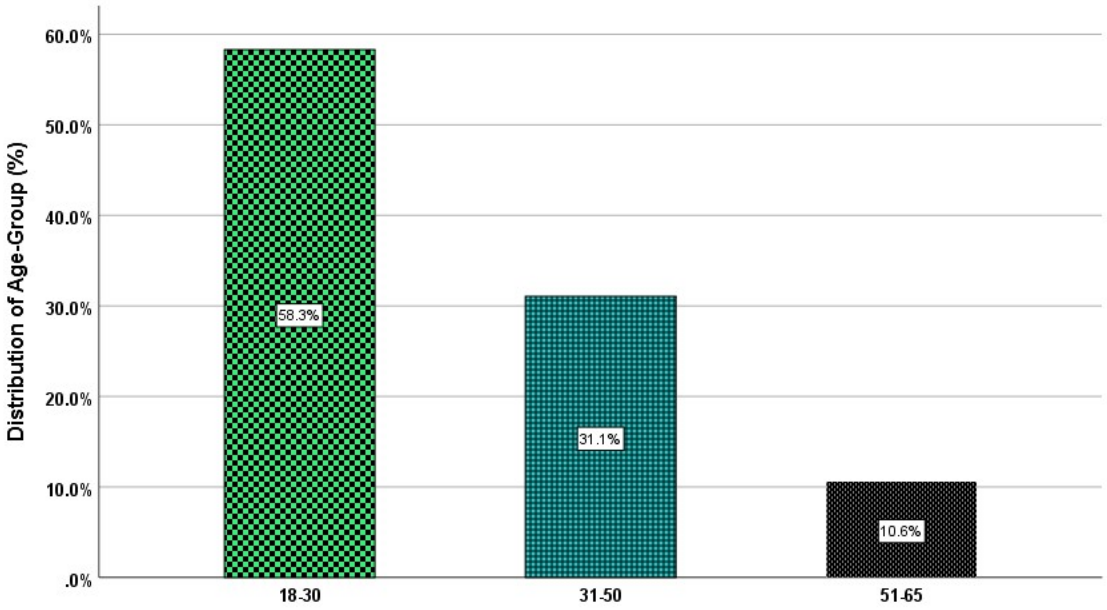
Ethical Considerations in Questionnaire Development:

Throughout the questionnaire development process, ethical considerations were paramount. The questionnaire was designed to respect participants' privacy and dignity, avoiding any intrusive or sensitive questions. Participants were assured that their responses would be kept confidential and used solely for research purposes. The study protocol, including the questionnaire, was reviewed and approved by the Screening Committee and Ethical Clearance Committee to ensure compliance with ethical standards.

Results and Research Findings

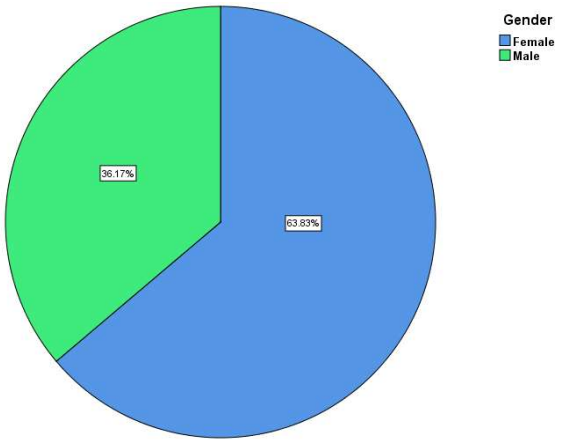
This section is a presentation of the results and findings drawn from the data analysis, supported by tabulated and graphical representation.

➢ Findings related to Demographic and background factors



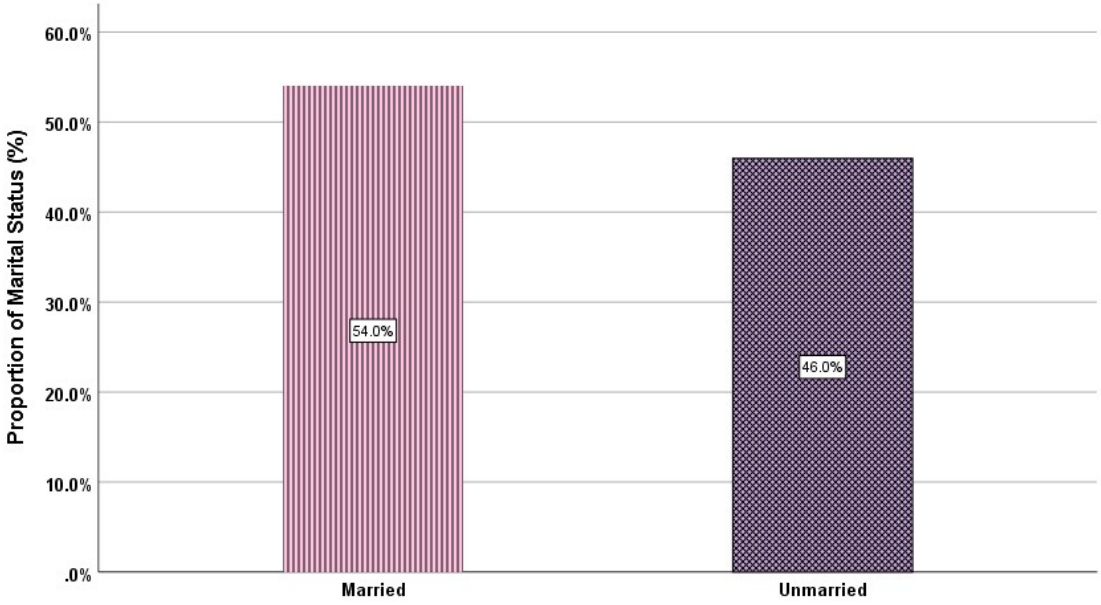
Bar-graph 1 : Distribution of Age-group

Bar-graph 1 depicts the age-group distribution in the sample size of 235 healthcare workers. 58.3% of the sample belong to the age-group of 18-35, representing the young population. 31.1% of the sample size belong to the age-group of 31-50, representing the middle-aged group. 10.6% of the sample size belong to the age-group of 51-65, representing the elderly group.



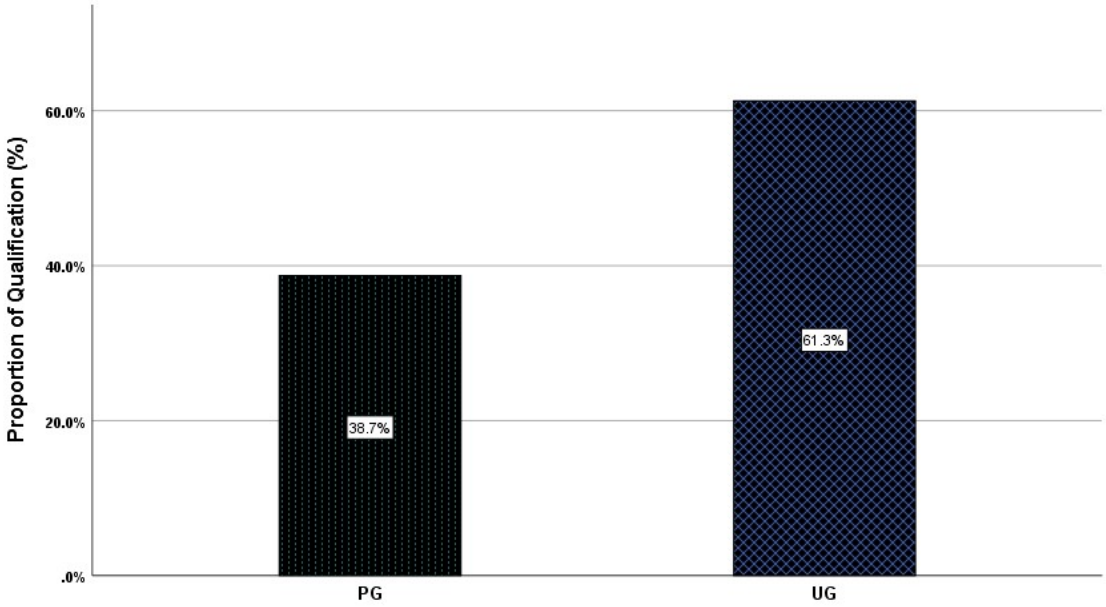
Pie-chart 1 : Gender distribution

Pie-chart 1 represents the gender distribution in the sample. 63.8% of the sample were females and 36.1% of the sample were males.



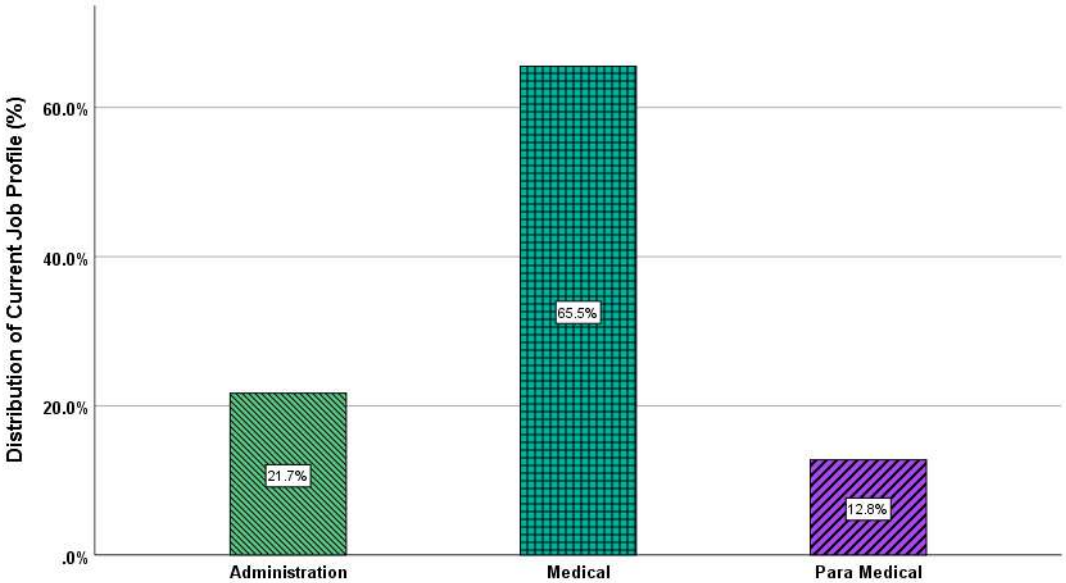
Bar-graph 2 : Distribution of Marital Status

Bar-graph 2 represents the distribution marital status of the sample size. According to this bar graph 54% were married and 46% were unmarried.



Bar-graph 3 : Distribution of Qualification

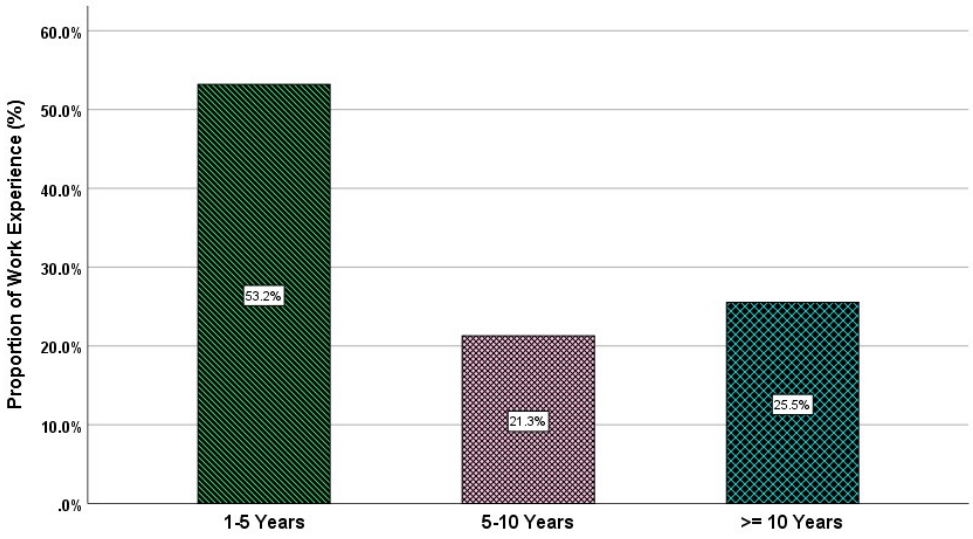
Bar-graph 3 represents the distribution of qualification in the sample size. 38.7% of the healthcare workers were post-graduated and 61.3% were under-graduated.



Bar-graph 4 : Distribution of Current Job profile

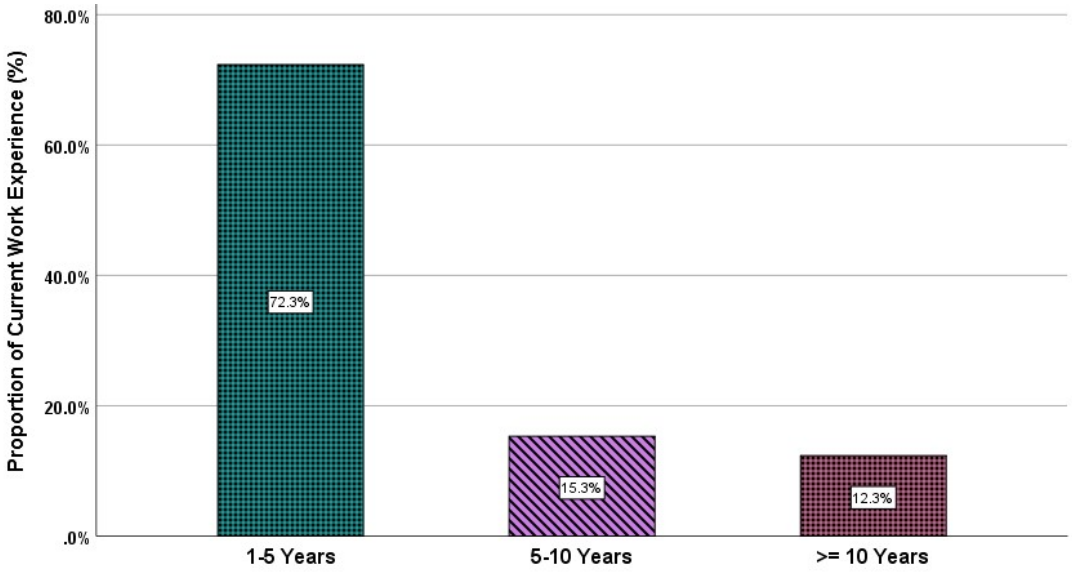
Bar-graph 4 depicts the distribution of current job profile. 65.5% of the sample belonged to the medical profession including doctors, surgeons, dentists, nurses, etc.

21.7% were from administration including public relation officers, operations managers, billing executives, third party administrator executives, etc. 12.8% were from para-medical profession including nutritionist, dietician, pharmacist, laboratory technician, operation theatre technician, etc.



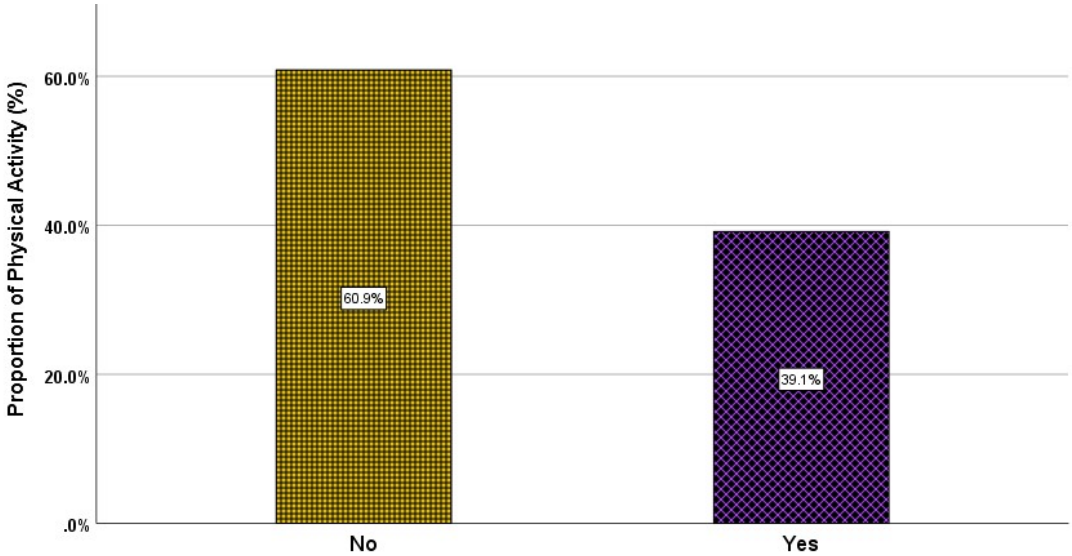
Bar-graph 5 : Total Work Experience (in years)

Bar-graph 5 represents the Total Work Experience in years of the healthcare workers. 53.2% of the sample size had 1-5 years of total work experience. 21.3% of the sample size had 5-10 years of total work experience. 25.5% of the sample size had >= 10 years of total work experience.



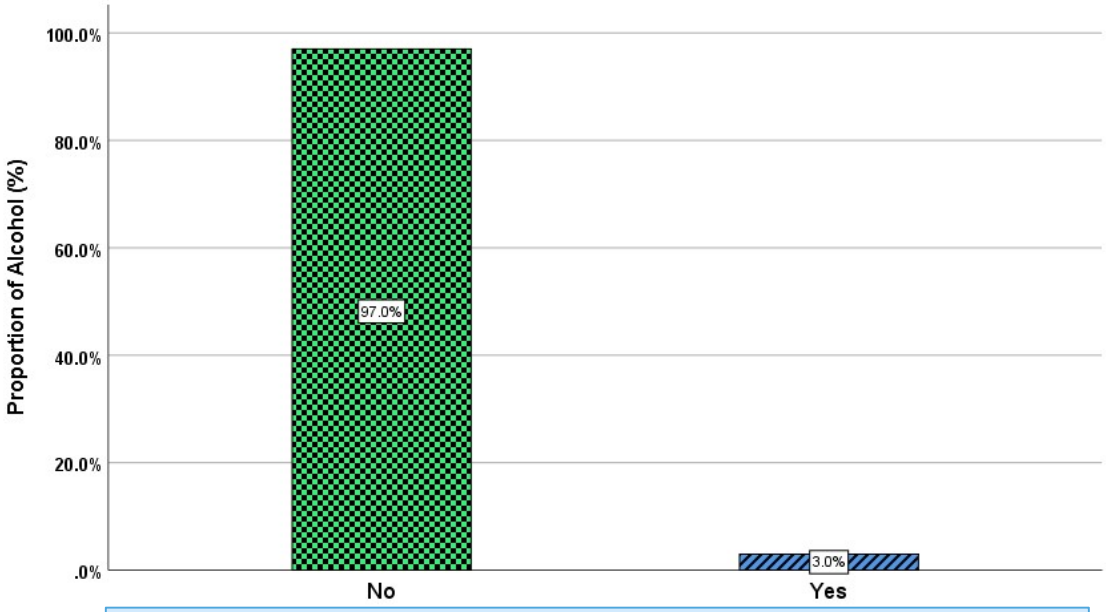
Bar-graph 6 : Current Work Experience (in years)

Bar graph 6 depicts the current work experience in years, indicating the number of years each individual has been employed at their current workplace. 72.3% of the sample size had 1-5 years of current work experience. 15.3 % of the sample size had 5-10 years of current work experience. 12.3% of the sample size had >=10 years of current work experience.



Bar-graph 7 : Involvement in Physical Activity

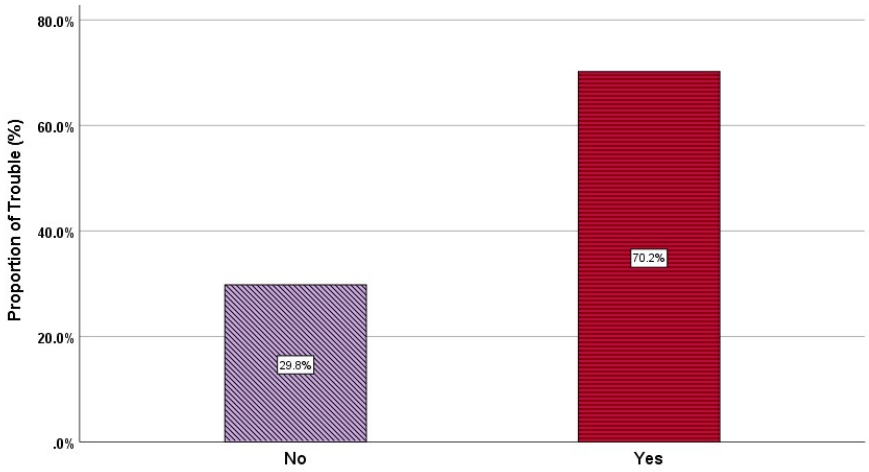
Bar-graph 7 represents the involvement in physical activity. 60.9% of the sample size reported no involvement in any kind of physical activity whereas 39.1% of the sample size reported that they were involved in some kind of physical activity.



Bar-graph 8 : Consumption of Alcohol

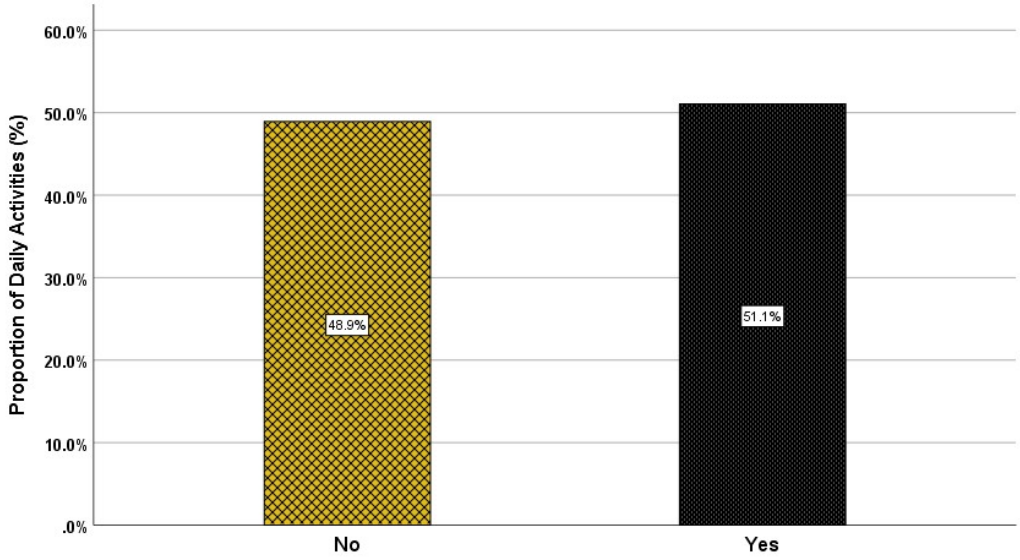
Bar-graph 8 represents the consumption of alcohol by the healthcare workers. 97% reported that they do not consume alcohol whereas 3% reported that they do.

➢ Findings related to Work-related Musculoskeletal Discomfort



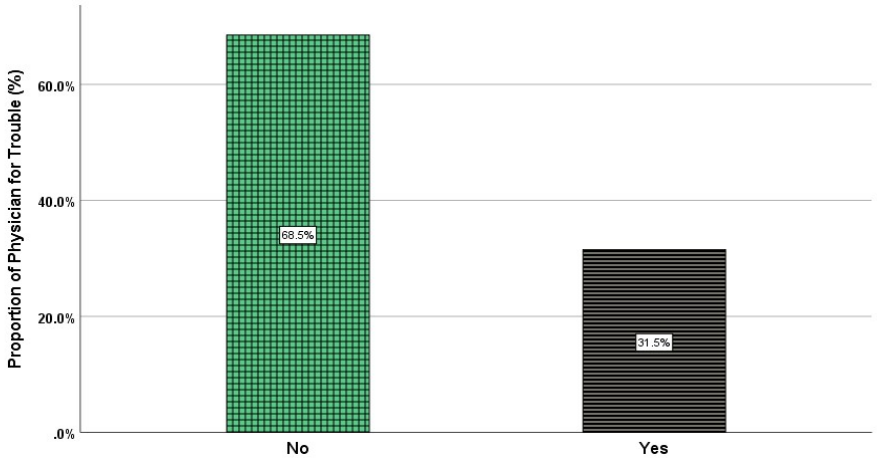
Bar-graph 9 : During the last 12 months did you face any trouble such as pain, discomfort, ache, etc.?

Bar-graph 9 represents the percentage of healthcare workers who faced any work-related trouble such as pain, discomfort, ache, etc. during the last 12 months. 70.2% reported that they did face the discomfort whereas 29.8% reported that they did not.



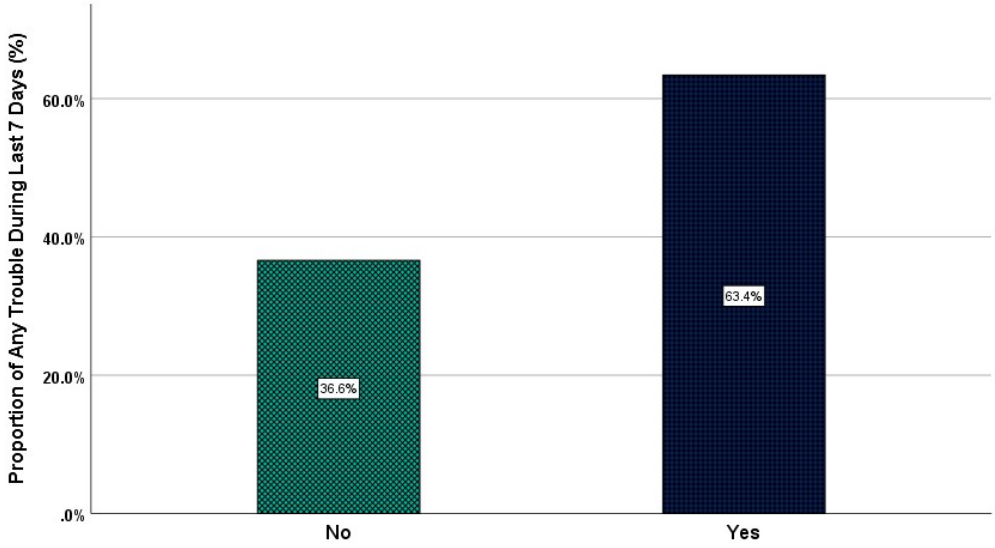
Bar-graph 10 : During last 12 months have you been prevented from carrying out daily activities due to trouble in?

Bar-graph 10 represents the percentage of healthcare workers who were prevented from carrying out daily activities due to this discomfort during last 12 months. 51.1% reported yes to this question and 48.9% reported no.



Bar-graph 11 : Did you see a physician for this trouble, during the last 12 months?

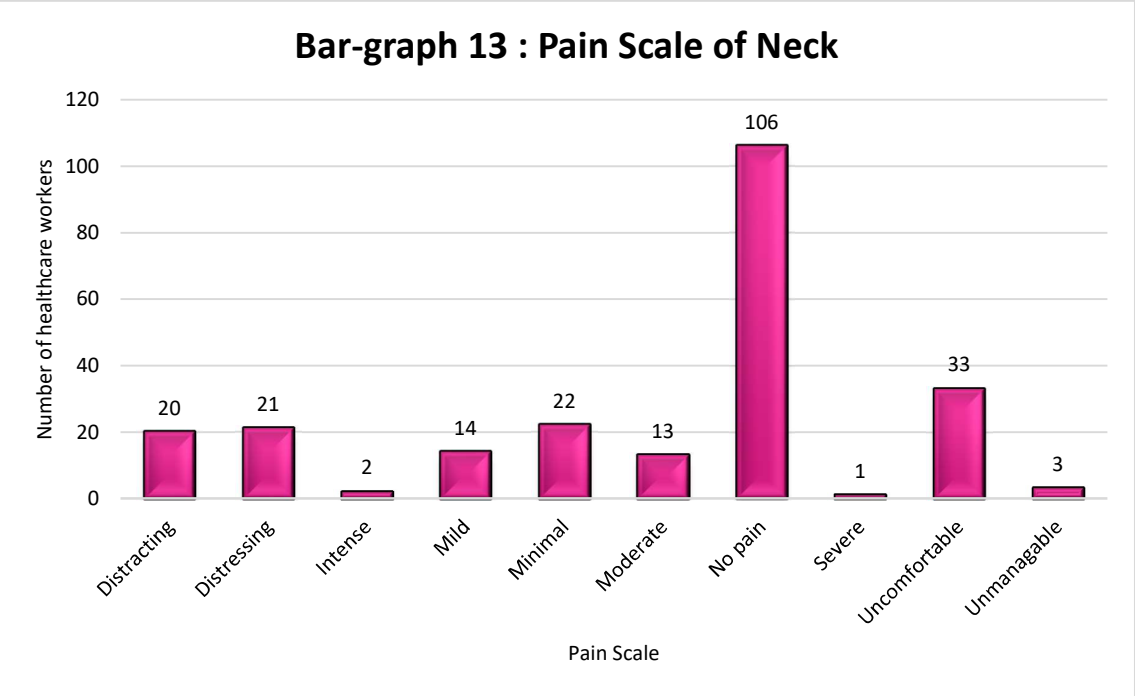
Bar-graph 11 represents the percentage of healthcare workers who had to see a physician for this discomfort, during the last 12 months. 31.5 % reported that they did visit the physician regarding the discomfort whereas 68.5% reported they did not.



Bar-graph 12 : During the last 7 days have you had any trouble?

Bar-graph 12 represents the percentage of healthcare workers who faced the discomfort during the last 7 days. 63.4% reported yes to this question whereas 36.6% reported no.

- **Findings related to the pain scale**



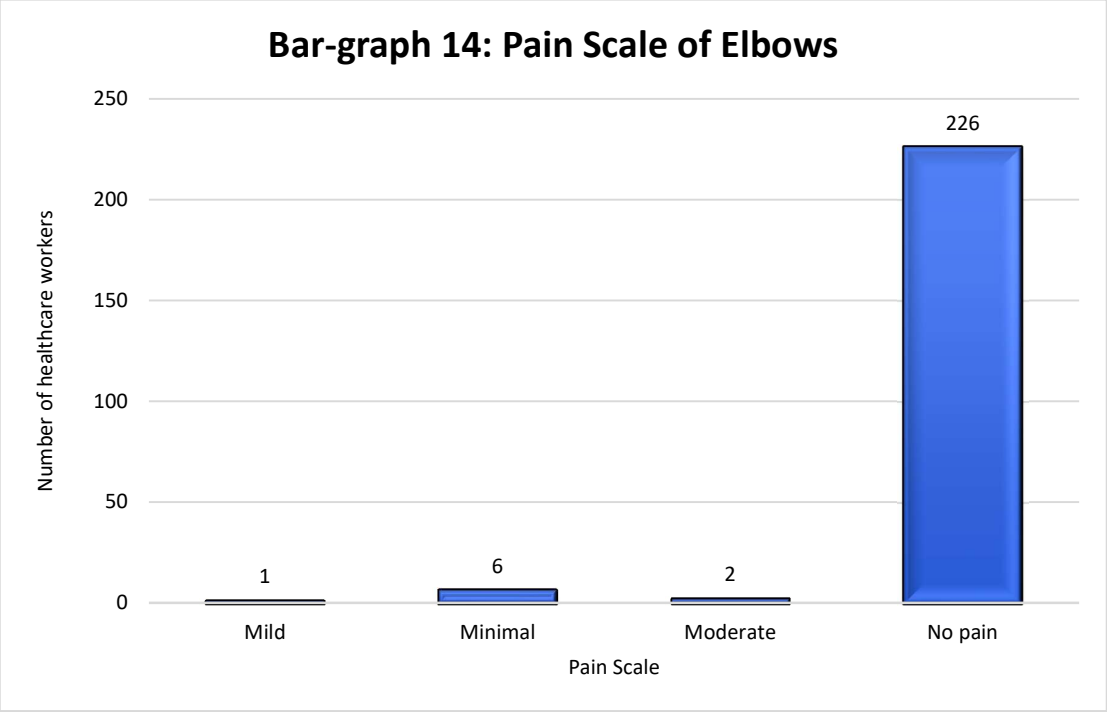
The bar graph illustrates the distribution of pain levels experienced by a group of individuals, specifically focusing on neck pain. The x-axis categorizes the pain scale into levels: Distracting, Distressing, Intense, Moderate, No pain, Severe, and Uncomfortable. The y-axis represents the number of individuals reporting each pain level.

The highest number of individuals reported experiencing Uncomfortable, Moderate, Distressing neck pain, followed by Distracting pain. A smaller number of individuals reported experiencing mild pain, while the lowest numbers were reported for Intense and Severe pain levels.

The majority of participants reported experiencing moderate levels of neck pain. A significant portion also reported distressing levels of neck pain. Relatively fewer individuals reported experiencing intense, severe pain.

The categories on the x-axis include:

- Distracting (20 healthcare workers)
- Distressing (21 healthcare workers)
- Intense (2 healthcare workers)
- Mild (14 healthcare workers)
- Minimal (22 healthcare workers)
- Moderate (13 healthcare workers)
- No pain (106 healthcare workers)
- Severe (1 healthcare worker)
- Uncomfortable (33 healthcare workers)
- Unmanageable (3 healthcare workers)



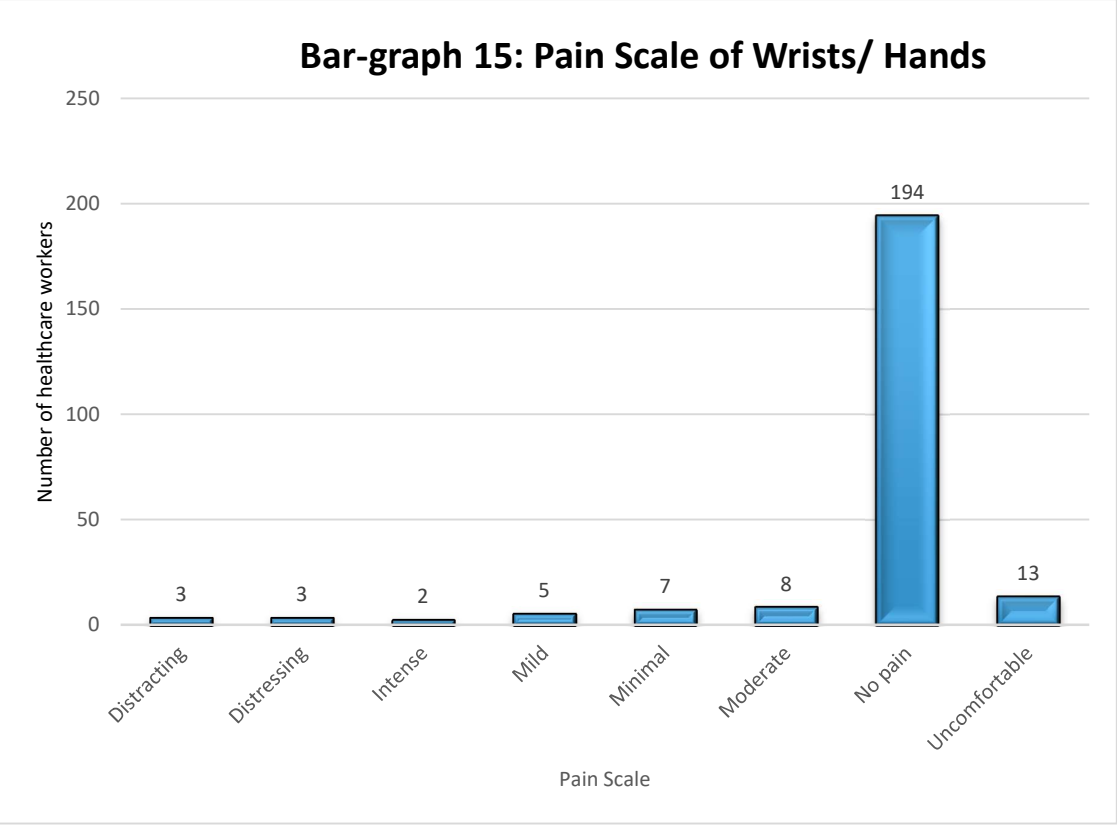
The bar graph presents the distribution of pain levels experienced in the elbows. The x-axis categorizes the pain intensity into levels: Mild, Moderate, and No pain. The y-axis represents the number of healthcare workers reporting each pain level.

The majority of participants reported experiencing no pain in their elbows, indicated by the tallest bar. A significantly smaller number reported experiencing minimal pain, while the fewest individuals reported mild pain.

The overwhelming majority of healthcare workers reported experiencing no pain in their elbows. A small but noticeable portion reported minimal pain. Very few healthcare workers reported moderate and mild pain in their elbows.

The categories on the x-axis include:

- Mild (1 healthcare worker)
- Minimal (6 healthcare workers)
- Moderate (2 healthcare workers)
- No pain (226 healthcare workers)



The bar graph presents the distribution of pain levels experienced in the wrists and hands. The x-axis categorizes the pain intensity into levels: Distracting, Distressing, Intense,

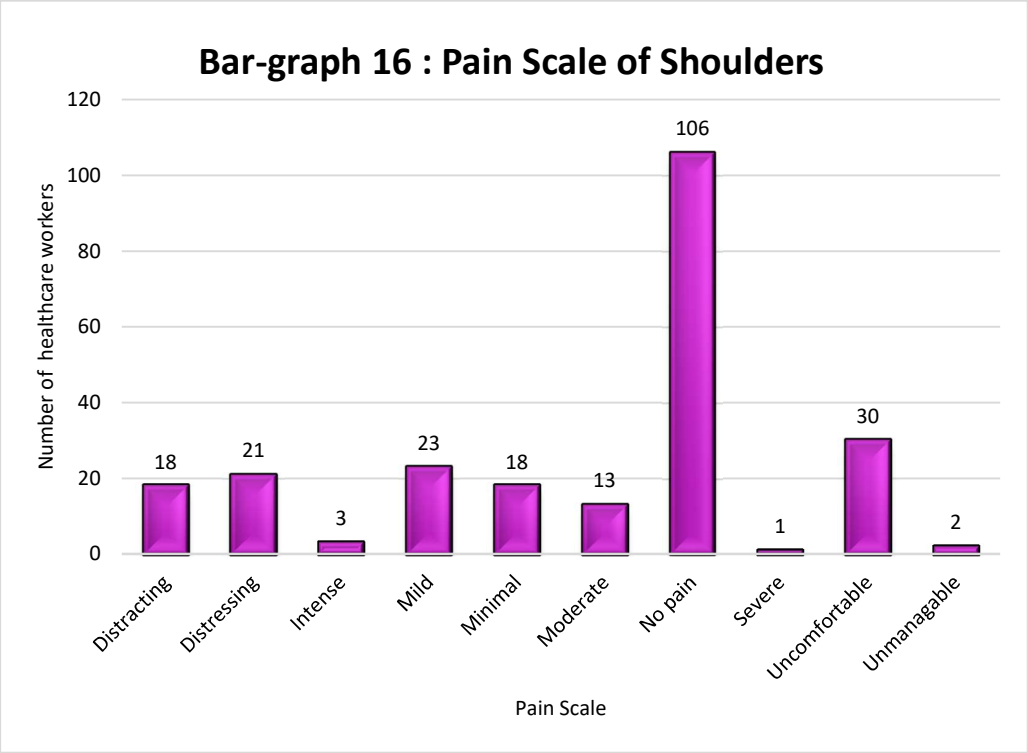
Moderate, No pain, Severe, and Uncomfortable. The y-axis represents the number of individuals reporting each pain level.

The majority of participants reported experiencing no pain in their wrists and hands, indicated by the tallest bar. A significantly smaller number reported experiencing moderate pain, while the fewest individuals reported mild pain. The rest of the pain levels, including distracting, distressing, intense, severe, and uncomfortable, have very few or no reports.

The overwhelming majority of individuals reported experiencing no pain in their wrists and hands. A small but noticeable portion reported moderate pain. Very few individuals reported mild, distracting, distressing, intense, severe, or uncomfortable pain in their wrists and hands.

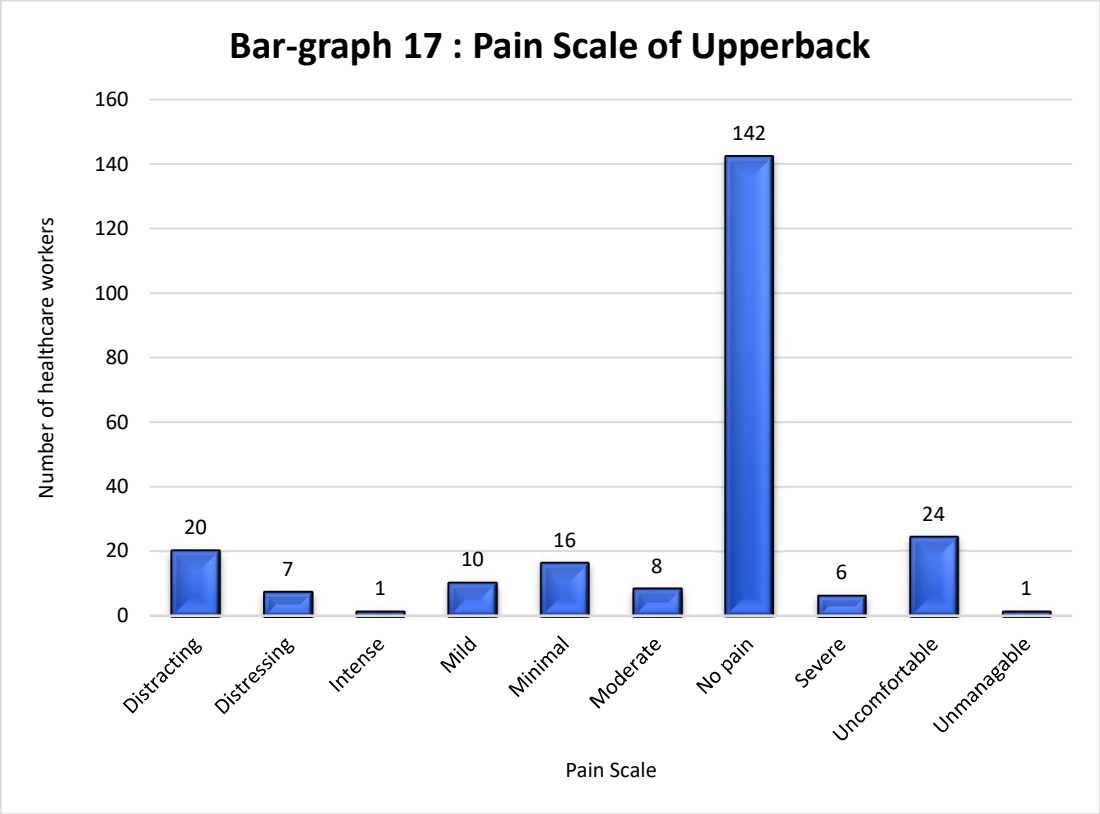
The categories on the x-axis include:

- Distracting (3 healthcare workers)
- Distressing (3 healthcare workers)
- Intense (2 healthcare workers)
- Mild (5 healthcare workers)
- Minimal (7 healthcare workers)
- Moderate (8 healthcare workers)
- No pain (194 healthcare workers)
- Uncomfortable (13 healthcare workers)



The bar graph presents the distribution of pain levels experienced in the shoulders. The x-axis categorizes the pain intensity into levels: Distracting, Distressing, Intense, Moderate, No pain, Severe, and Uncomfortable. The y-axis represents the number of healthcare workers reporting each pain level.A significant number reported experiencing uncomfortable, mild, distressing and distracting pain levels. Following that, a smaller number reported experiencing moderate pain, with even fewer reporting severe and intense and unmanageable pain.

- Distracting (18 healthcare workers)
- Distressing (21 healthcare workers)
- Intense (3 healthcare workers)
- Mild (23 healthcare workers)
- Minimal (18 healthcare workers)
- Moderate (13 healthcare workers)
- No pain (106 healthcare workers)
- Severe (1 healthcare worker)
- Uncomfortable (30 healthcare workers)
- Unmanageable (2 healthcare workers)



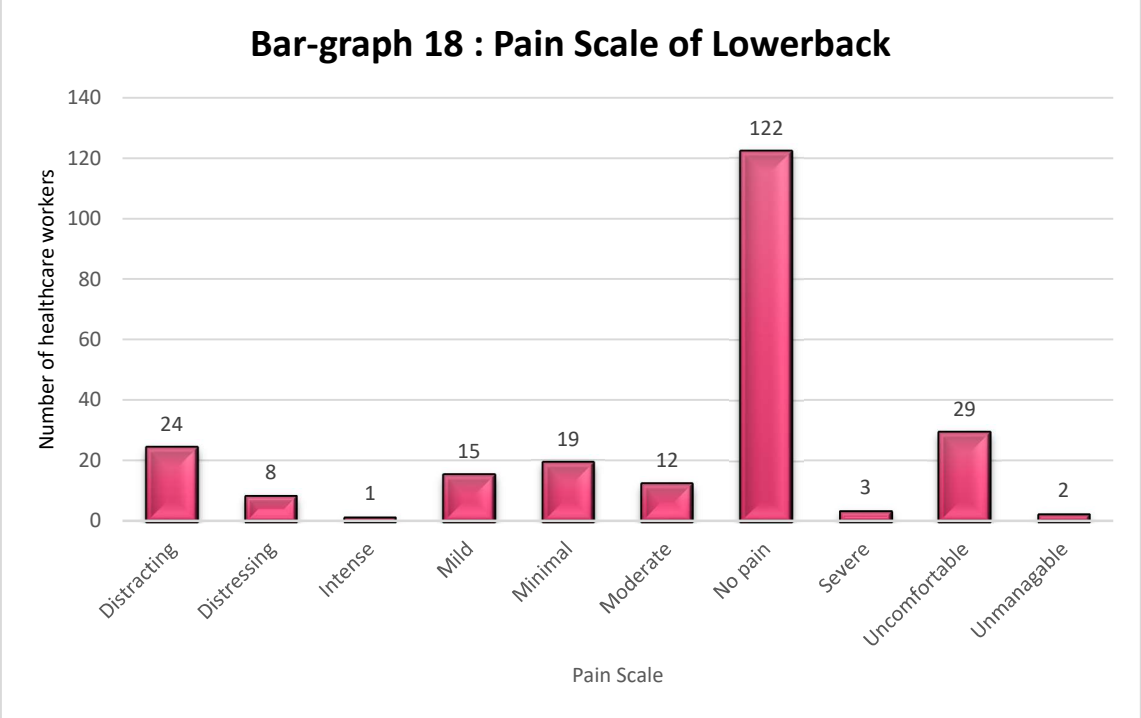
The bar graph presents the distribution of pain levels experienced in the upper back. The x-axis categorizes the pain intensity into levels: Distracting, Distressing, Intense, Moderate, No pain, Severe, and Uncomfortable. The y-axis represents the number of healthcare workers reporting each pain level.

The highest number of healthcare workers reported experiencing No pain in their upper back, indicated by the tallest bar. A significant number also reported experiencing Uncomfortable, Distracting and Minimal pain. Following that, a smaller number reported experiencing Mild and Distressing pain, with even fewer reporting Severe and intense pain.

The categories on the x-axis include:

- Distracting (20 healthcare workers)
- Distressing (7 healthcare workers)
- Intense (1 healthcare worker)
- Mild (10 healthcare workers)
- Minimal (16 healthcare workers)

- Moderate (8 healthcare workers)
- No pain (142 healthcare workers)
- Severe (6 healthcare workers)
- Uncomfortable (24 healthcare workers)
- Unmanageable (1 healthcare worker)



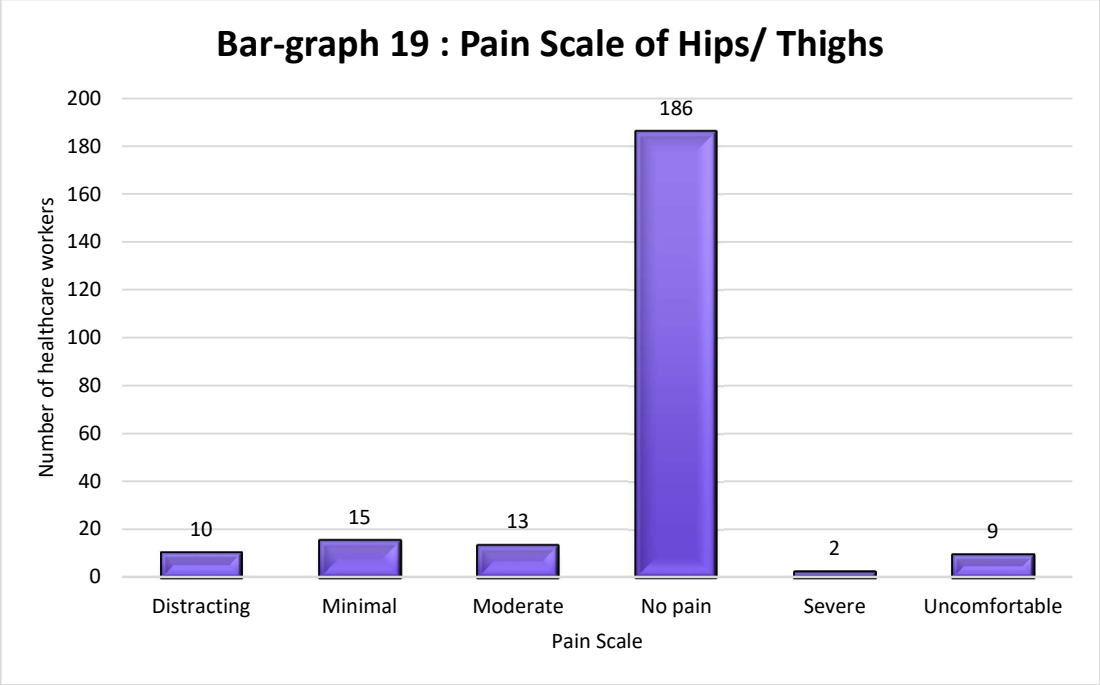
The bar graph presents the distribution of pain levels experienced in the lower back. The x-axis categorizes the pain intensity into levels: Distracting, Distressing, Intense, Moderate, Severe, Uncomfortable, and No pain. The y-axis represents the number of healthcare workers reporting each pain level.

The categories on the x-axis include:

- Distracting (24 healthcare workers)
- Distressing (8 healthcare workers)
- Intense (1 healthcare worker)
- Mild (15 healthcare workers)
- Minimal (19 healthcare workers)
- Moderate (12 healthcare workers)

- No pain (122 healthcare workers)
- Severe (3 healthcare workers)
- Uncomfortable (29 healthcare workers)
- Unmanageable (2 healthcare workers)

A significant number also reported experiencing Uncomfortable, Distracting and Distressing pain levels. Following that, a smaller number reported experiencing Moderate and Mild pain, with even fewer reporting Severe and pain. The lowest numbers were reported for Unmanageable and Intense pain levels.

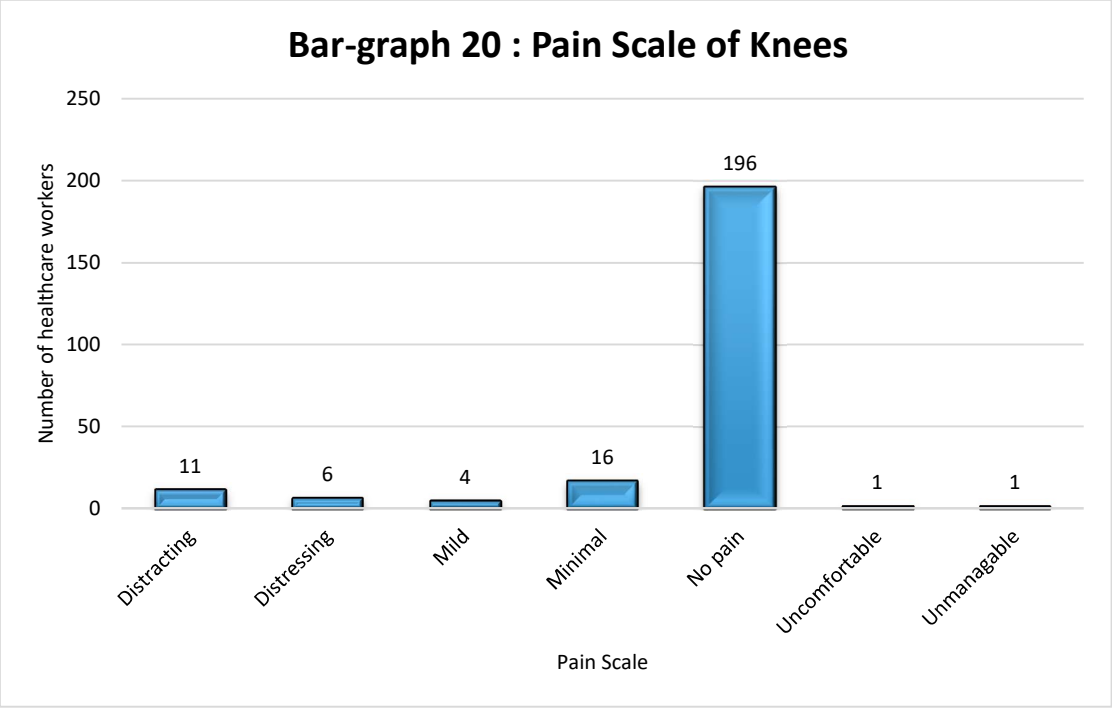


The bar graph presents the distribution of pain levels experienced in the hips and thighs. The x-axis categorizes the pain intensity into levels: Distracting, Minimal, Moderate, No pain, Uncomfortable, Severe, and Intense. The y-axis represents the number of healthcare workers reporting each pain level.

The categories on the x-axis include:

- Distracting: 10
- Minimal: 15
- Moderate: 13

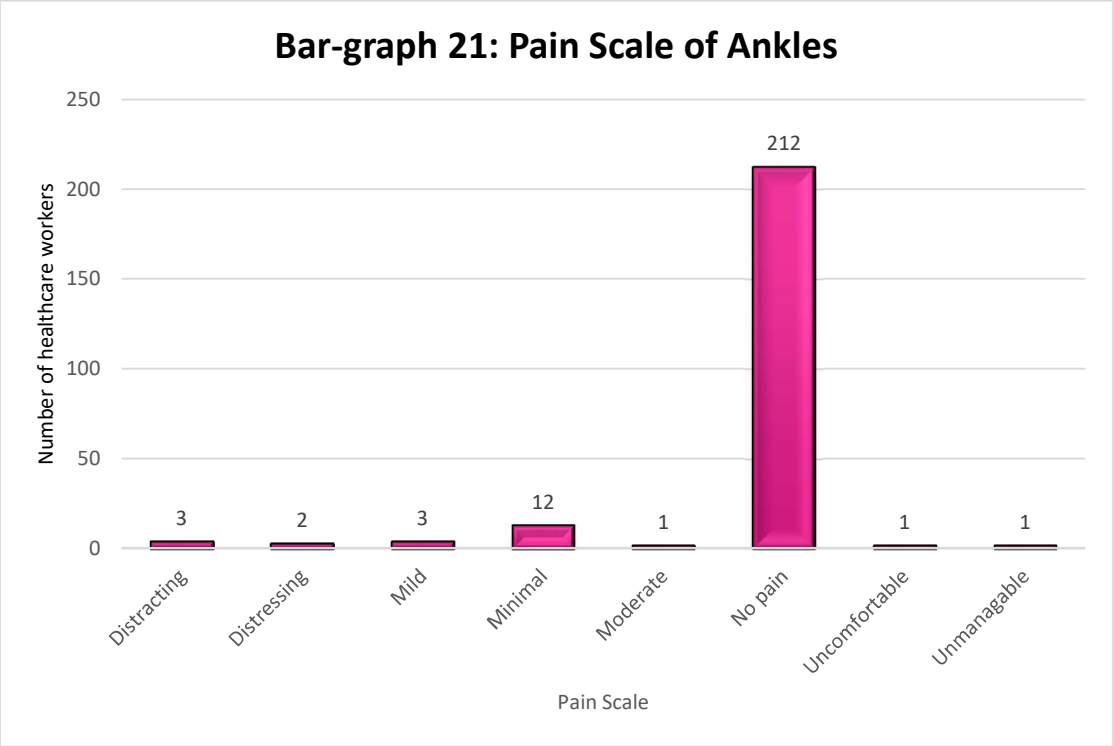
- No pain: 186
- Severe: 2
- Uncomfortable: 9
- Minimal and Moderate Pain:



The bar graph presents the distribution of pain levels experienced in the knees. The x-axis categorizes the pain intensity into levels: Distracting, Distressing, Mild, Minimal, No pain, Uncomfortable and Unmanageable. The y-axis represents the number of healthcare workers reporting each pain level.

The categories on the x-axis include:

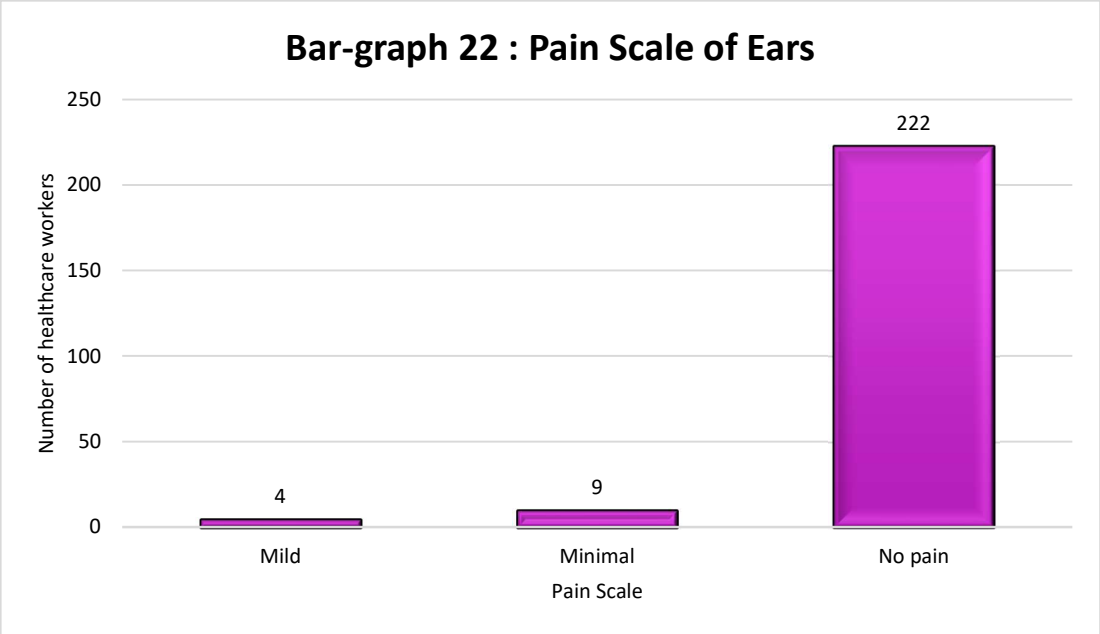
- Distracting: 11
- Distressing: 6
- Mild: 4
- Minimal: 16
- No pain: 196
- Uncomfortable: 1
- Unmanageable: 1



The bar graph presents the distribution of pain levels experienced in the ankles. The x-axis categorizes the pain intensity into levels: Distracting, Distressing, Mild, Minimal, Moderate, No pain, Uncomfortable and Unmanageable. The y-axis represents the number of healthcare workers reporting each pain level.

The categories on the x-axis include:

- Distracting: 3
- Distressing: 2
- Mild: 3
- Minimal: 12
- Moderate: 1
- No pain: 212
- Uncomfortable: 1
- Unmanageable: 1

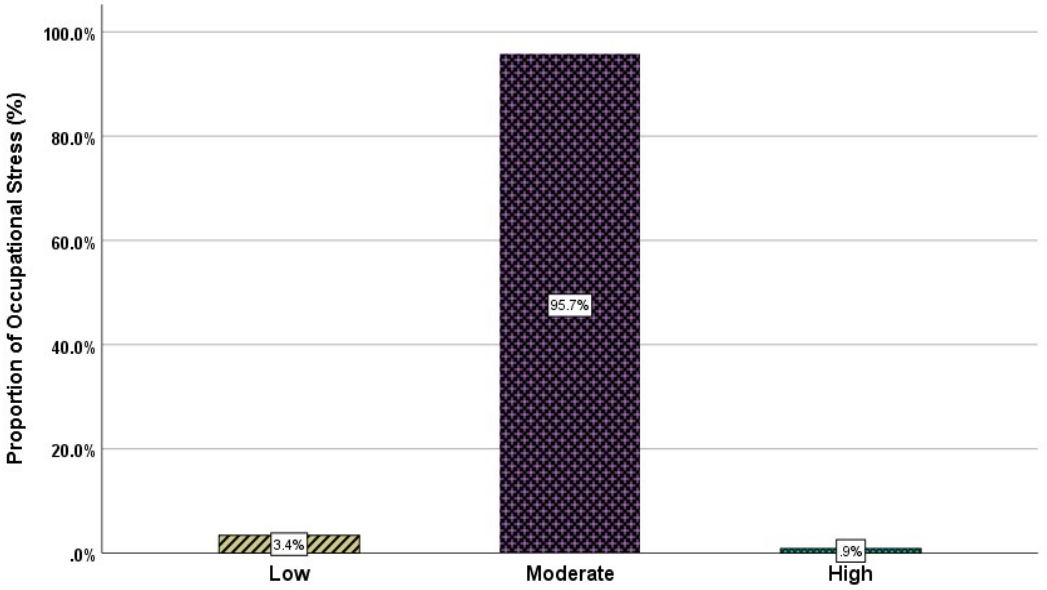


The bar graph presents the distribution of pain levels experienced in the ears. The x-axis categorizes the pain intensity into levels: Mild, Minimal and No pain. The y-axis represents the number of healthcare workers reporting each pain level.

The categories on the x-axis include:

- Mild: 4
- Minimal: 9
- No pain: 222

➢ Findings related to Occupational Stress



Bar-graph 23 : Occupational Stress among healthcare workers

Bar graph 23 represents the percentage of occupational stress among healthcare workers. 3.4% of the sample experienced low occupational stress, and 0.9% experienced high occupational stress. The majority, 95.7%, fell into the moderate stress category. Further individual analysis revealed that their scores were in the higher range of moderate stress.

Table 2 : Rate of Occupational Stress among healthcare workers						
			Occupational Stress			
			Low	Moderate	High	
Current Job Profile	Administration	Count	4	47	0	
		% within Current Job Profile	7.8%	92.2%	0.0%	
	Medical	Count	4	148	2	
		% within Current Job Profile	2.6%	96.1%	1.3%	
	Para Medical	Count	0	30	0	
		% within Current Job Profile	0.0%	100.0%	0.0%	
Total		Count	8	225	2	
		% within Current Job Profile	3.4%	95.7%	0.9%	

Table 2 depicts the rate of occupational stress among healthcare workers with diverse job roles.

- In a sample of 235 healthcare workers, 4 administrative healthcare workers (7.8%) experienced low occupational stress, while 47 (92.2%) experienced highly moderate occupational stress.
- Among the medical healthcare workers, 4 (2.6%) experienced low occupational stress, 148 (96.1%) experienced moderate occupational stress, and 2 (1.3%) experienced high occupational stress.
- For the para-medical healthcare workers, all 30 participants (100%) experienced high occupational stress.

Table 3 : Workload and time pressure					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	15	6.4	6.4	6.4
	2	18	7.7	7.7	14.0
	3	63	26.8	26.8	40.9
	4	120	51.1	51.1	91.9
	5	19	8.1	8.1	100.0
	Total	235	100.0	100.0	

Table 3 represents the workload and time pressure experienced by the healthcare workers.

In a sample of 235 healthcare workers, 6.4% never felt workload, 7.7 % rarely felt any kind of workload and 26.8% sometimes felt immense workload whereas 51.1% often sometimes felt immense workload and 8.1% always felt immense workload.

Table 4 : Control and decision making					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	72	30.6	30.6	30.6
	2	64	27.2	27.2	57.9
	3	30	12.8	12.8	70.6
	4	42	17.9	17.9	88.5
	5	27	11.5	11.5	100.0
	Total	235	100.0	100.0	

Table 4 represents the Control and decision-making ability experienced by the healthcare workers.

In a sample of 235 healthcare workers, 30.6% never felt Control and decision-making ability in their occupation, 27.2 % rarely felt any kind of Control and decision-making ability in their occupation and 12.8% sometimes felt Control and decision-making ability in their occupation, whereas 17.9% often sometimes felt Control and decision-making ability in their occupation, and 11.5% always felt Control and decision-making ability in their occupation.

Table 5 : Job satisfaction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	31	13.2	13.2	13.2
	2	80	34.0	34.0	47.2
	3	54	23.0	23.0	70.2
	4	49	20.9	20.9	91.1
	5	21	8.9	8.9	100.0
	Total	235	100.0	100.0	

Table 5 represents the Job satisfaction experienced by the healthcare workers.

In a sample of 235 healthcare workers, 13.2% never felt satisfied in their occupation, 34 % rarely felt satisfied in their occupation and 23% sometimes felt satisfied in their occupation, whereas 20.9% often felt satisfied in their occupation, and 8.9% always felt satisfied in their occupation.

Table 6 : Work-life balance					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	204	86.8	86.8	86.8
	2	11	4.7	4.7	91.5
	3	10	4.3	4.3	95.7
	4	6	2.6	2.6	98.3
	5	4	1.7	1.7	100.0
	Total	235	100.0	100.0	

Table 6 represents the maintenance of work-life balance by the healthcare workers.

In a sample of 235 healthcare workers, 86.8% were never able to maintain work-life balance, 4.7% were rarely able to maintain work-life balance and 4.3% were sometimes able to maintain work-life balance, whereas 2.6% were often able to maintain work-life balance, and 1.7% were always able to maintain work-life balance.

Table 7 : Exhaustion due to work					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	8	3.4	3.4	3.4
	2	36	15.3	15.3	18.7
	3	64	27.2	27.2	46.0
	4	108	46.0	46.0	91.9
	5	19	8.1	8.1	100.0
	Total	235	100.0	100.0	

Table 7 represents the exhaustion due to work among the healthcare workers.

In a sample of 235 healthcare workers, 3.4% were never exhausted due to work, 15.3% were rarely exhausted due to work and 27.2% were sometimes exhausted due to work, whereas 46% were often exhausted due to work, and 8.1% were always exhausted due to work.

Since this question was asked in the physical and emotional well-being subsection of occupational stress, it indicates the overall physical and emotional exhaustion among the healthcare workers.

Table 8 : Job security

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	26	11.1	11.1	11.1
	2	68	28.9	28.9	40.0
	3	94	40.0	40.0	80.0
	4	42	17.9	17.9	97.9
	5	5	2.1	2.1	100.0
	Total	235	100.0	100.0	

Table 8 represents the job security of healthcare workers.

In a sample of 235 healthcare workers, 11.1% never felt job security in their occupation, 28.9% rarely felt job security in their occupation and 40% sometimes felt job security in their occupation, whereas 17.9% often felt job security in their occupation, and 2.1% always felt job security in their occupation.

Table 9 : Work recognition					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	49	20.9	20.9	20.9
	2	88	37.4	37.4	58.3
	3	57	24.3	24.3	82.6
	4	28	11.9	11.9	94.5
	5	13	5.5	5.5	100.0
	Total	235	100.0	100.0	

Table 9 represents the work recognition among healthcare workers.

In a sample of 235 healthcare workers, 20.9% never felt recognised in their occupation, 37.4% rarely felt recognised in their occupation and 24.3% sometimes felt recognised in their occupation, whereas 11.9% often felt recognised in their occupation, and 5.51% always felt recognised in their occupation.

Table 10 : Psychosomatic symptoms					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	116	49.4	49.4	49.4
	2	16	6.8	6.8	56.2
	3	58	24.7	24.7	80.9
	4	43	18.3	18.3	99.1
	5	2	.9	.9	100.0
	Total	235	100.0	100.0	

Table 10 represents the psychosomatic symptoms experienced by the healthcare workers.

In a sample of 235 healthcare workers, 49.4% never experienced any kind of psychosomatic symptoms, 6.8% rarely experienced any kind of psychosomatic symptoms and 24.7% sometimes experienced some psychosomatic symptoms whereas 18.3% often experienced psychosomatic symptoms and 0.9% always experienced psychosomatic symptoms.

- **Key factors contributing to the development of work-related musculoskeletal discomfort and occupational stress.**

Work-related musculoskeletal discomfort

WMSD is a complex issue influenced by a combination of factors. Key contributors include:

Physical Factors:

Ergonomics: Poor workstation design, improper posture, repetitive tasks, forceful exertions, and static postures.

Manual handling: Lifting, carrying, pushing, and pulling heavy loads.

Vibration: Exposure to hand-arm vibration (HAV) from tools and equipment.

Work environment: Temperature, humidity, and lighting.

Psychosocial Factors:

Job demands: High workload, time pressure, and work overload.

Job control: Lack of autonomy and decision-making power.

Social support: Inadequate support from colleagues and supervisors.

Role ambiguity: Unclear job expectations and responsibilities.

Individual Factors:

Age: Older workers may be more susceptible due to physical changes.

Gender: Differences in physical strength and work roles.

Physical fitness: Poor physical condition can increase risk.

Previous injuries: Existing musculoskeletal problems can be aggravated.

Occupational Stress

Occupational stress arises from a mismatch between job demands and an individual's resources to cope. Key factors include:

Job-related Factors:

Workload: Excessive or insufficient workload.

Role ambiguity: Lack of clarity about job responsibilities.

Job insecurity: Fear of job loss.

Work-life balance: Difficulty balancing work and personal life.

Organizational Factors:

Organizational change: Mergers, downsizing, or restructuring.

Leadership style: Demanding or unsupportive leadership.

Organizational culture: Unhealthy competition or lack of support.

Table 11 : Association between occupational stress and background factors					
Variables	Occupational Stress			$\chi 2$ value	p value
	Low (%)	Moderate (%)	High (%)		
Gender				9.442	0.009
Female	1.3	98.7	0	9.442	0.009
Male	7.1	90.6	2.4	9.442	0.009
Alcohol				22.119	0
Yes	28.6	42.9	28.6	22.119	0
No	2.6	97.4	0	22.119	0
Qualification				11.697	0.003
UG	5.6	94.4	0	11.697	0.003
PG	0	97.8	2.2	11.697	0.003
Physical Activity				8.307	0.16
Yes	6.5	91.3	2.2	8.307	0.16
No	1.4	98.6	0	8.307	0.16
Current Work Experience				10.141	0.38
1-5 years	3.5	96.5	0	10.141	0.38
5-10 years	5.6	88.9	5.6	10.141	0.38
>=10 years	0	100	0	10.141	0.38

Table 11 represents the association between occupational stress and background factors.

According to this association females were more occupationally stressed as compared to males. Workers who consumed alcohol were found to be more occupationally stressed than those who did not consume alcohol. Post graduate workers were comparatively more occupationally stressed than the under graduate workers. Healthcare workers who were not involved in any kind of physical activity were found to be more occupationally stressed than those who performed physical activity.

➢ Recommendations for Promoting a Healthier and Ergonomically Sound Work Environment for Healthcare Workers

Ergonomic Interventions

Adjustable Workstations

Recommendation: Provide adjustable workstations that can be customized to fit individual needs. This includes height-adjustable desks and chairs with lumbar support to promote proper posture.

Implementation: Conduct ergonomic assessments for each department and purchase adjustable equipment tailored to the specific needs of different job roles.

Ergonomic Training

Recommendation: Implement regular ergonomic training sessions to educate healthcare workers on proper posture, lifting techniques, and the use of ergonomic tools.

Implementation: Partner with ergonomic specialists to conduct workshops and develop online training modules accessible to all staff.

Assistive Devices

Recommendation: Provide assistive devices such as patient lifting equipment, anti-fatigue mats, and ergonomic keyboards and mice to reduce physical strain.

Implementation: Invest in high-quality assistive devices and ensure they are readily available and easy to use in high-need areas such as patient wards and administrative offices.

Stress Management Programs

Mindfulness and Relaxation Techniques

Recommendation: Introduce mindfulness and relaxation techniques such as yoga, meditation, and deep-breathing exercises as part of the daily routine.

Implementation: Offer on-site classes during breaks and create quiet spaces where staff can practice these techniques independently.

Counselling Services

Recommendation: Provide access to counselling services to help healthcare workers manage stress and cope with emotional challenges.

Implementation: Establish a partnership with mental health professionals to offer confidential counselling sessions and support groups within the hospital.

Peer Support Programs

Recommendation: Develop peer support programs where healthcare workers can share experiences and provide mutual support.

Implementation: Create a peer support network and schedule regular meetings facilitated by trained staff to foster a sense of community and shared understanding.

Workload Management

Optimized Scheduling

Recommendation: Implement optimized scheduling practices to ensure equitable distribution of workload and adequate rest periods.

Implementation: Use scheduling software to create balanced work schedules and involve staff in shift planning to accommodate personal preferences and reduce burnout.

Adequate Staffing Levels

Recommendation: Ensure adequate staffing levels to prevent excessive workloads and allow for manageable patient-to-staff ratios.

Implementation: Conduct regular staffing assessments and hire additional staff as needed to maintain optimal workforce levels.

Task Delegation

Recommendation: Promote task delegation and teamwork to distribute workload more evenly and prevent overburdening individual staff members.

Implementation: Train team leaders to delegate tasks effectively and encourage a collaborative work environment where team members support each other.

Enhancing Job Control and Decision-Making

Participatory Decision-Making

Recommendation: Involve healthcare workers in decision-making processes related to their work environment and job roles.

Implementation: Establish committees or working groups where staff can voice their opinions and contribute to policy and procedural changes.

Professional Development Opportunities

Recommendation: Provide opportunities for professional development and career advancement to enhance job satisfaction and reduce stress.

Implementation: Offer continuous education programs, leadership training, and opportunities for career progression within the organization.

Promoting Work-Life Balance

Flexible Work Schedules

Recommendation: Implement flexible work schedules that allow healthcare workers to balance their professional and personal lives effectively.

Implementation: Offer options for part-time work, job-sharing, and flexible start and end times to accommodate individual needs.

Family-Friendly Policies

Recommendation: Develop family-friendly workplace policies that support healthcare workers with family responsibilities.

Implementation: Provide childcare services, parental leave, and support for caregivers within the organization.

Encouraging Time Off

Recommendation: Encourage healthcare workers to take regular breaks and use their vacation time to recharge and prevent burnout.

Implementation: Monitor staff workload and encourage the use of paid time off to ensure they have adequate rest and recuperation.

Addressing Exhaustion

Adequate Rest Periods

Recommendation: Ensure healthcare workers have adequate rest periods during shifts to prevent exhaustion and fatigue.

Implementation: Implement mandatory break times and provide comfortable rest areas where staff can relax and recharge.

Wellness Programs

Recommendation: Develop wellness programs that focus on physical activity, nutrition, and mental health to promote overall well-being.

Implementation: Offer on-site fitness classes, healthy meal options in the cafeteria, and regular health check-ups to support a holistic approach to wellness.

Sleep Hygiene Education

Recommendation: Educate healthcare workers on the importance of sleep hygiene and provide resources to help them improve their sleep habits.

Implementation: Distribute educational materials on sleep hygiene, offer workshops, and provide access to sleep aids if needed.

Discussion

The study aimed to explore the rate and factors associated with work-related musculoskeletal discomfort and occupational stress among healthcare workers. The findings from this study provide insights into the demographic distribution, prevalence of musculoskeletal discomfort, levels of occupational stress, and the interplay between these factors. This discussion will delve into the interpretation of the results, comparisons with existing literature, implications for practice, and recommendations for future research.

Demographic and Background Factors

Age-Group Distribution

The age-group distribution indicates that a significant portion of the workforce (58.3%) is within the 18-35 years age bracket, consistent with the demographic profile of many healthcare institutions globally. Studies in various regions, including the U.S. and Europe, have similarly reported that younger healthcare workers experience different stressors compared to older workers, such as job insecurity and career development pressures. The presence of a substantial middle-aged group (31.1%) and a smaller elderly group (10.6%) in this study highlights the need for interventions that cater to a multi-generational workforce.

Gender Distribution

The gender distribution, with 63.8% female and 36.1% male participants, reflects the broader gender composition in the healthcare sector. Similar findings are reported in studies from other countries, such as a study in Sweden where women reported higher levels of stress and musculoskeletal discomfort compared to men . This could be due to several factors, including gender roles and occupational segregation. Female healthcare workers often juggle multiple roles, balancing professional responsibilities with domestic duties, which can exacerbate stress and physical strain.

Marital Status

Marital status emerged as a significant factor, with 54% of the participants being married. This finding aligns with existing research, indicating that married individuals may face additional stressors, such as family responsibilities, impacting their work-life balance and overall stress levels. Studies have shown that married healthcare workers often report higher

levels of stress due to the dual demands of work and family. Conversely, unmarried individuals might focus more on career progression and professional challenges.

Educational Qualification

Participants' educational qualifications, with 38.7% being post-graduates and 61.3% undergraduates, can influence their perception of job stress and susceptibility to musculoskeletal discomfort. Higher educational attainment might correlate with better knowledge of ergonomics and stress management techniques. However, it can also be associated with higher job demands and responsibilities. A study in Canada found that higher educational levels were linked to increased stress due to greater job responsibilities.

Current Job Profile

The study's findings that 65.5% of participants were from the medical profession highlight the physically demanding nature of medical roles. Similar results were found in a study conducted in the UK, where medical professionals reported higher rates of musculoskeletal discomfort compared to administrative staff. Administrative (21.7%) and para-medical professionals (12.8%) also face unique challenges, underscoring the need for comprehensive health and well-being programs across various job roles within the healthcare sector.

Total and Current Work Experience

The distribution of total and current work experience, with 53.2% having 1-5 years of total experience and 72.3% having 1-5 years of current work experience, suggests a relatively young workforce. Less experienced workers might face greater challenges in coping with job demands, leading to higher stress levels and a greater risk of musculoskeletal discomfort. These findings are consistent with a study from Australia, which found that younger, less experienced healthcare workers reported higher stress levels .

Involvement in Physical Activity

The significant finding that 60.9% of participants reported no involvement in physical activity is concerning. Physical inactivity is a known risk factor for musculoskeletal discomfort and can exacerbate stress levels. A study in the Netherlands found that regular physical activity significantly reduced the prevalence of musculoskeletal pain among healthcare workers. Encouraging healthcare workers to engage in regular physical activity through workplace wellness programs can help reduce these risks.

Alcohol Consumption

The data showing that 97% of participants did not consume alcohol suggests that alcohol consumption is not a prevalent coping mechanism among this sample. This contrasts with some studies in Western countries where higher rates of alcohol use among healthcare workers have been reported as a stress-coping mechanism. The low alcohol consumption rate in this study might reflect cultural factors or effective stress management strategies within the hospital.

Work-Related Musculoskeletal Discomfort

Prevalence and Impact

The study found that 70.2% of healthcare workers reported experiencing work-related musculoskeletal discomfort in the last 12 months. This high prevalence aligns with global trends, as similar rates have been reported in studies from the U.S. and Europe. The significant impact on daily activities reported by 51.1% of participants emphasizes the need for interventions to address these issues. Research from Japan has shown that ergonomic interventions can significantly reduce the prevalence of musculoskeletal discomfort.

Physician Visits and Recent Discomfort

Despite the high prevalence of discomfort, only 31.5% of participants visited a physician for their symptoms in the last 12 months. This finding is consistent with other studies that highlight barriers to seeking medical help, such as time constraints and fear of stigma. Additionally, 63.4% reported experiencing discomfort in the last 7 days, indicating persistent issues. Encouraging timely medical intervention is crucial to prevent the progression of musculoskeletal problems.

Pain Scale Analysis

Neck Pain

The majority of participants reported moderate levels of neck pain, aligning with existing literature that identifies neck pain as a common issue among healthcare workers due to prolonged standing or awkward postures. Similar findings have been reported in studies from Finland and Germany. Ergonomic interventions and posture training can help reduce the risk of neck pain.

Elbow, Wrist, and Hand Pain

Most participants reported no pain in the elbow, wrist, and hand, although some experienced minimal to moderate pain. These areas are less commonly affected compared to the neck and back but can still be problematic, especially in roles involving repetitive hand movements. A study in Sweden found similar results, suggesting that ergonomic practices can mitigate pain in these regions.

Shoulder Pain

Shoulder pain levels were notably high, with many participants reporting uncomfortable, mild, and distressing pain. Similar findings have been reported in studies from Canada and Australia, where shoulder pain is prevalent due to physically demanding tasks such as lifting and transferring patients. Proper lifting techniques and assistive devices can help reduce shoulder pain.

Back Pain

Both upper and lower back pain were prevalent among participants, with significant numbers reporting uncomfortable and distracting pain. Back pain is a well-documented issue globally among healthcare workers, often resulting from lifting patients and prolonged standing. Ergonomic training and support for proper body mechanics are essential for reducing back pain.

Hip, Thigh, Knee, and Ankle Pain

Pain in the hip, thigh, knee, and ankle was less common but still reported by some participants. These regions can be affected by prolonged standing and walking, similar to findings in studies from the U.K. and South Africa. Supportive footwear and regular breaks to reduce standing time can help alleviate pain in these areas.

Ear Pain

Ear pain was the least reported, suggesting it is not a significant concern among healthcare workers in this study. However, monitoring auditory issues remains important, especially for those working in noisy environments, as indicated by studies in the U.S.

Occupational Stress

Levels of Occupational Stress

The study revealed that 95.7% of healthcare workers experienced moderate stress, consistent with findings from studies in the U.S. and Europe, where high levels of stress are reported among healthcare professionals. Addressing occupational stress through targeted interventions is crucial for improving health and well-being.

Occupational Stress by Job Profile

Occupational stress varied by job profile, with para-medical professionals experiencing the highest levels of moderate stress (100%). This finding aligns with studies from Canada and Australia, highlighting the widespread nature of stress across different roles in the healthcare sector. Developing targeted stress management programs can help reduce overall stress levels.

Workload and Time Pressure

A significant portion of participants (51.1%) reported feeling overwhelmed by workload and time pressure. Similar findings have been reported in studies from Germany and Japan, where high workloads and time pressures are common stressors. Managing workload and time pressure through optimized schedules and adequate support is essential for reducing stress levels.

Control and Decision-Making

The data showed that 30.6% of participants never felt control and decision-making ability in their roles, with another 27.2% rarely feeling it. This lack of control contributes significantly to occupational stress, as autonomy and decision-making are crucial for job satisfaction . Providing opportunities for healthcare workers to participate in decision-making processes can reduce stress levels and improve job satisfaction.

Work-Life Balance

Work-life balance is critical in managing occupational stress. The study found that many participants often felt that work interfered with their personal life, consistent with findings from studies in the U.S. and Europe . Promoting work-life balance through flexible work schedules and family-friendly policies can help reduce stress and improve well-being.

Exhaustion

Exhaustion emerged as a significant issue, with many participants reporting high levels of exhaustion due to their work. Similar findings have been reported in studies from Australia and the U.K., highlighting the physical and mental toll of healthcare work . Addressing exhaustion through adequate staffing levels and wellness programs can improve health and well-being.

Recommendations for Practice

Ergonomic Interventions

Implementing ergonomic interventions is crucial for reducing musculoskeletal discomfort. This includes providing adjustable workstations, ergonomic chairs, and tools that reduce physical strain. Studies from Japan and Canada have shown that ergonomic interventions significantly reduce musculoskeletal discomfort among healthcare workers.

Stress Management Programs

Developing and implementing stress management programs is essential for addressing occupational stress. These programs should include training on stress management techniques such as mindfulness and relaxation exercises. Providing access to counselling services can help healthcare workers cope with stress. Similar programs have shown success in studies from the U.S. and Europe.

Workload Management

Addressing workload and time pressure is crucial for reducing occupational stress. Healthcare institutions should consider implementing policies to manage workloads, such as hiring additional staff and optimizing work schedules. Studies from Germany and Japan support the effectiveness of these interventions in reducing stress.

Enhancing Job Control and Decision-Making

Increasing healthcare workers' control and decision-making ability can significantly reduce occupational stress and improve job satisfaction. This can be achieved by involving healthcare workers in decision-making processes and providing opportunities for professional development. Studies from Canada and Australia have shown the positive impact of these measures on stress reduction.

Promoting Work-Life Balance

Promoting work-life balance is essential for reducing occupational stress and improving overall well-being. Healthcare institutions should implement policies that support work-life balance, such as flexible work schedules and family-friendly workplace policies. Studies from the U.S. and Europe highlight the importance of work-life balance in reducing stress .

Addressing Exhaustion

Addressing the high levels of exhaustion among healthcare workers requires a multifaceted approach. Providing adequate staffing levels, ensuring reasonable work hours, and promoting healthy sleep habits are critical for reducing exhaustion. Wellness programs focusing on physical activity, nutrition, and mental health can also help. Similar approaches have been successful in studies from Australia and the U.K.

Recommendations for Future Research

Longitudinal Studies

Future research should consider longitudinal studies to track changes in musculoskeletal discomfort and occupational stress over time. Longitudinal studies can provide insights into the long-term effects of interventions and are supported by findings from studies in the U.S. and Europe.

Intervention Studies

Intervention studies are needed to evaluate the effectiveness of various interventions in reducing musculoskeletal discomfort and occupational stress. Studies from Canada and Japan have highlighted the importance of evaluating the impact of ergonomic training, stress management programs, and workload management strategies.

Comparative Studies

Comparative studies can provide valuable insights into differences in musculoskeletal discomfort and occupational stress across different healthcare settings and demographic groups. Comparing healthcare workers in different countries and regions can help identify best practices. Studies from the U.S. and Europe support the value of comparative research.

Qualitative Research

Qualitative research is essential for understanding the subjective experiences of healthcare workers regarding musculoskeletal discomfort and occupational stress. In-depth interviews and focus groups can provide valuable insights. Studies from Australia and the U.K. highlight the importance of qualitative research in understanding healthcare workers' experiences.

Technological Innovations

Future research should explore the role of technological innovations in reducing musculoskeletal discomfort and occupational stress. Wearable devices, telehealth solutions, and virtual reality training programs are promising areas for investigation. Studies from the U.S. and Japan support the potential of technological innovations in improving healthcare workers' health and well-being.

This study highlights the significant prevalence of work-related musculoskeletal discomfort and occupational stress among healthcare workers. The findings underscore the need for targeted interventions to address these issues, including ergonomic adjustments, stress management programs, workload management strategies, and policies that promote work-life balance and job satisfaction. By addressing these challenges, healthcare institutions can improve the health and well-being of their workforce, enhance job performance, and ensure the delivery of high-quality patient care. Future research should continue to explore effective interventions and strategies to mitigate musculoskeletal discomfort and occupational stress, ultimately contributing to a healthier and more resilient healthcare workforce.

Limitations of the Study

Sample Size and Generalizability

Limitation: The study's sample size may not be large enough to generalize the findings to all healthcare settings or to different regions outside the specific context of the tertiary care teaching hospital in Ghaziabad, India.

Implication: This limitation affects the ability to extrapolate results to other healthcare facilities with varying organizational structures, patient loads, and demographic characteristics.

Cross-Sectional Design

Limitation: The cross-sectional design of the study captures data at a single point in time, which limits the ability to infer causality or observe changes over time.

Implication: This limitation prevents the evaluation of interventions over extended periods.

Potential Confounding Variables

Limitation: The study may not account for all potential confounding variables, such as differences specific departmental demands.

Implication: Failure to control for these variables may lead to incomplete or skewed findings regarding the relationship between WRMD, occupational stress, and work environment.

Intervention Assessment

Limitation: If the study included an assessment of interventions, the evaluation may not fully capture the effectiveness of these interventions due to short follow-up periods or lack of control groups.

Implication: This limitation impacts the ability to assess the true impact of ergonomic and stress management interventions on WRMD and overall well-being.

Data Collection Methods

Limitation: The methods used for data collection, such as surveys or interviews, may have inherent biases or limitations that affect the accuracy and depth of the information gathered.

Implication: These methodological constraints may impact the study findings.

Conclusion

This study has highlighted the significant rate of WRMD and occupational stress among healthcare workers. The complex interplay between physical discomfort and psychological stress underscores the need for integrated approaches to managing both aspects of health. By addressing the identified limitations and focusing on recommended practices, healthcare organizations can work towards creating a healthier and more ergonomically sound workplace.

Improving ergonomic practices, implementing effective stress management programs, and addressing broader policy and environmental factors are crucial steps in enhancing the well-being of healthcare workers. Continued research and proactive measures will be essential in mitigating the impact of WRMD and stress, ultimately contributing to the overall health, satisfaction, and productivity of healthcare professionals.

The findings from this study provide a foundation for future research and intervention strategies, offering valuable insights into the challenges faced by healthcare workers and the steps needed to address them. As healthcare systems continue to evolve, ongoing efforts to improve worker health and well-being will be critical in ensuring a sustainable and effective healthcare workforce.

Summary of Findings

In this extensive study, we investigated the prevalence, impact, and interrelationship of work-related musculoskeletal discomfort (WRMD) and occupational stress among healthcare workers. Our research sought to elucidate the underlying factors contributing to these issues and assess the effectiveness of current ergonomic practices and stress management strategies. The key findings of our study offer significant insights into how WRMD and occupational stress intersect and influence the well-being of healthcare professionals.

Rate and Impact of WRMD

Our research revealed a high prevalence of WRMD among healthcare workers. The majority of participants reported experiencing discomfort or pain in areas such as the lower back, neck, and shoulders—regions commonly affected by repetitive strain and poor ergonomic practices. This finding is consistent with the literature, which highlights these areas as

particularly vulnerable in healthcare settings due to frequent physical tasks, awkward postures, and manual handling activities.

The intensity and frequency of WRMD reported by participants underscore the serious impact on their physical health and overall job satisfaction. Workers experiencing chronic discomfort are more likely to suffer from reduced work performance, increased absenteeism, and diminished quality of life. This alignment with existing studies reinforces the urgent need for effective interventions to address WRMD in healthcare environments.

Occupational Stress and Its Relationship with WRMD

Our study also found a significant prevalence of occupational stress among healthcare workers. Stress levels were notably correlated with the incidence of WRMD, suggesting a complex and reciprocal relationship between psychological and physical health. Workers who reported high levels of stress also experienced greater musculoskeletal discomfort, indicating that stress may exacerbate the perception of pain and contribute to the development of WRMD.

These findings support theoretical models that propose stress can amplify physical discomfort by increasing muscle tension, reducing pain thresholds, and affecting overall health. The interplay between stress and WRMD highlights the importance of integrated approaches to managing both physical and psychological aspects of health in the workplace.

Ergonomic Practices and Their Effectiveness

The assessment of ergonomic practices within the hospital revealed a mixed picture. While some departments adhered to ergonomic standards and implemented measures such as adjustable workstations and proper manual handling techniques, others lagged in adopting these practices. This variability in ergonomic implementation suggests that while certain positive steps have been taken, there remains considerable room for improvement.

The effectiveness of existing ergonomic interventions was uneven, with some workers benefiting from improved workstation design and equipment, while others continued to experience discomfort due to inadequate ergonomic support. This discrepancy emphasizes the need for consistent and comprehensive ergonomic practices across all departments to ensure that all healthcare workers can benefit from improved working conditions.

Risk Factors and Contributing Variables

Our study identified several risk factors contributing to WRMD and occupational stress, including job role, workload, shift patterns, and physical demands. High-demand roles, such as those in emergency and intensive care units, were associated with higher levels of both WRMD and stress. Irregular shift patterns and long working hours also emerged as significant contributors to discomfort and stress.

These findings highlight the need for targeted interventions that address specific risk factors. For example, reducing the physical demands of high-stress roles and optimizing shift patterns could help alleviate both WRMD and stress, leading to better overall health outcomes for healthcare workers.

Implications for Practice

Enhancing Ergonomic Interventions

The study's findings underscore the importance of enhancing ergonomic interventions to mitigate WRMD and its associated stress. Healthcare organizations should focus on the following key areas to improve ergonomics and reduce discomfort:

Comprehensive Ergonomic Training: Providing all healthcare workers with detailed ergonomic training to ensure proper techniques for manual handling, workstation setup, and posture. Training should be ongoing and adapted to evolving work practices and technologies.

Routine Ergonomic Assessments: Implementing regular ergonomic assessments to evaluate and address potential hazards in workstations and tasks. These assessments should be conducted by trained ergonomists and involve input from healthcare workers to identify and resolve ergonomic issues effectively.

Investment in Ergonomic Equipment: Ensuring that all healthcare workers have access to appropriate ergonomic equipment, such as adjustable chairs, supportive footwear, and ergonomic tools. This investment should be coupled with training on how to use the equipment correctly.

Stress Management Programs

To address occupational stress, healthcare organizations should develop and implement effective stress management programs, including:

Mental Health Support Services: Providing access to mental health resources, such as counselling services and stress management workshops. Creating a supportive environment where workers feel comfortable seeking help is crucial for effective stress management.

Workload Management: Reviewing and adjusting workloads to prevent excessive strain. This may involve redistributing tasks, providing additional support staff, or implementing measures to balance the workload more equitably across shifts and roles.

Promoting a Supportive Work Culture: Fostering a work culture that values open communication, teamwork, and recognition. Encouraging regular feedback and acknowledging achievements can help reduce stress and improve job satisfaction.

Policy and Environmental Changes

Addressing broader policy and environmental factors can further enhance worker well-being:

Optimized Scheduling Practices: Designing shift patterns that allow for adequate rest and recovery. Implementing flexible scheduling options and minimizing the frequency of long or irregular shifts can help reduce stress and improve overall health.

Work Environment Enhancements: Improving the physical work environment to reduce strain, such as upgrading lighting, reducing noise levels, and ensuring that workspaces are ergonomically designed. Environmental improvements can contribute to both physical comfort and psychological well-being.

Regular Health Monitoring: Implementing routine health screenings and assessments to monitor the physical and psychological health of healthcare workers. Regular monitoring can help identify early signs of discomfort or stress and allow for timely interventions.

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Annexures

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Annexure 1

Occupational Health Questionnaire

A DEMOGRAPHIC DETAILS

Name (Optional) -

Marital Status -

Age -

Qualification -

Sex -

Current Job Profile -

Phone no.-

Total Work Experience -

Address -

Work Experience in current job-

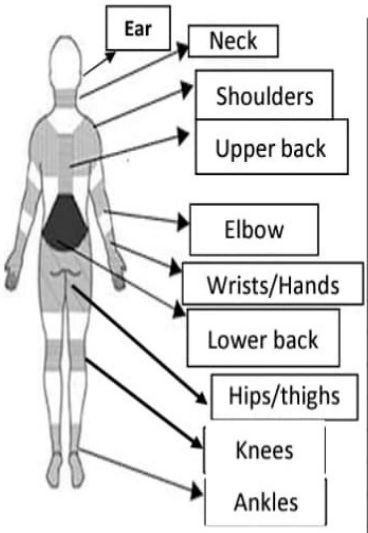
Are you involved in any kind of physical activity? Yes No

Time to reach your workplace (in hours) _____

Habits: Tobacco- Yes No

Alcohol- Yes No

B Work-related musculoskeletal discomfort



	During the last 12 months did you face any trouble such as pain, discomfort, ache,etc. in (mark yes or no)-	During last 12 months have you been prevented from carrying out daily activities due to trouble in(mark yes or no)-	Did you see a physician for this trouble ,during the last 12 months-	During the last 7 days have you had any trouble in-	Rate your pain on a scale of 0 to 10
Neck					
Shoulders					
Elbows					
Wrists/Hands					
Upperback					
Lowerback					
Hips/thighs					
Knees					
Ankles					
Ears					

Pain scale-				
	0 - no pain	3 - uncomfortable	6- distressing	9- severe
	1 -minimal	4 - moderate	7-unmanagable	10 - unable
	2 - mild	5 - distracting	8 - intense	

व्यावसायिक स्वास्थ्य प्रश्नावली

ए जनसांख्यिकीय विवरण

नाम: (वैकल्पिक) -

आयु -

लिंग -

फोन नंबर-

पता -

वैवाहिक स्थिति -

योग्यता -

वर्तमान जॉब प्रोफ़ाइल -

कुल कार्य अनुभव -

वर्तमान नौकरी में कार्य अनुभव-

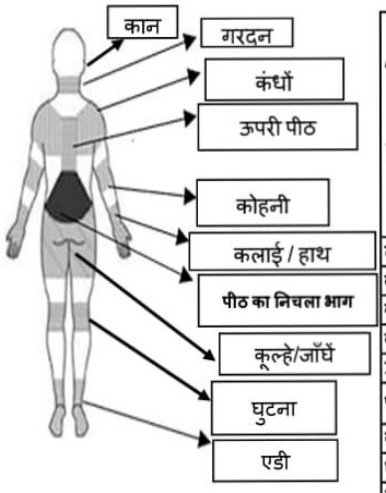
क्या आप किसी भी प्रकार की शारीरिक गतिविधि में शामिल हैं? हाँ | नहीं

कार्यस्थल पहुँचने में समय (घंटे) -

आदतें: तम्बाकू- हाँ | नहीं

शराब- हाँ | नहीं

बी काम से संबंधित मस्कुलोस्केलेटल असुविधा



	पिछले 12 महीनों के दौरान क्या आपको दर्द, बेचैनी, आदि जैसी किसी परेशानी का सामना करना पड़ा? (हां या ना का निशान लगाएं)-	पिछले 12 महीनों के दौरान क्या आपको परेशानी के कारण दैनिक गतिविधियाँ करने से रोका गया है (हाँ या नहीं पर निशान लगाएं)-	क्या आपने पिछले 12 महीनों के दौरान इस परेशानी के लिए किसी चिकित्सक को दिखाया था?	पिछले 7 दिनों के दौरान क्या आपको कोई परेशानी हुई-	अपने दर्द को 0 से 10 के पैमाने पर रेट करें
गरदन					
कंधों					
कोहनी					
कलाई/हाथ					
ऊपरी पीठ					
पीठ का निचला भाग					
कूल्हे/जाँघें					
घुटनों					
एड़ियों					
कान					

दर्द का पैमाना- 0 - शून्य पीड़ा, 1- न्यूनतम, 2- सौम्य, 3 - असहज, 4 - मध्यम, 5 - ध्यान भटकाना, 6- कष्टकारी, 7-अनियंत्रित, 8 - तीव्र, 9- गंभीर, 10 - हिलने-

		Never	Rarely	Some times	Often	Always
1	Do you lift, push or pull heavy loads while working?					
2	Do you have to lift loads in an awkward posture?					
3	Do you bend, twist or turn heavily with your trunk?					
4	Do you lift your arms above shoulder height for your work?					
5	Do you work in uncomfortable postures?					
6	Do you squat or stoop for prolonged time during your work?					
7	Do you work in same postures for prolonged time?					
8	Do you have to make small movements with your hands and fingers for work?					
9	Do you have enough room around you to perform your work properly?					
10	Do you need physical aid to complete your work?					
11	Do you need to take leave due to discomfort caused by your work tasks?					
C	**Occupational Stress**					
	Workload and time pressure	**Never**	**Rarely**	**Some times**	**Often**	**Always**
1	My workload has increased.					
2	I feel overwhelmed by my workload.					
3	I struggle to find enough time to complete my tasks.					
4	I frequently feel pressurised due to tight deadlines.					
5	I feel stressed when there is too much work to handle.					
6	I undertake more tasks than I can handle at a single time.					
7	I often have to work overtime.					
8	I feel the need to always complete my work with perfection.					
	Control and decision making	**Never**	**Rarely**	**Some times**	**Often**	**Always**
1	I am involved in decision making processes related to my work.					
2	I feel undervalued when I don't have a say in my work tasks.					
3	I feel i do not havde enough control over my work tasks.					
4	I often feel powerless to influence decisions that affect my work.					
5	My recommendations are often implemented.					

	Work environment	**Never**	**Rarely**	**Some times**	**Often**	**Always**
1	I have access to a comfortable and suitable workplace.					
2	I feel stressed due to the conditions at my workplace.					
4	My productivity is negatively affected due to these distractions.					
	Work relations	**Never**	**Rarely**	**Some times**	**Often**	**Always**
1	I feel isolated, ignored and unsupported at my workplace.					
2	I face conflicts with my colleagues.					

		कभी नहीं	बहुत कम	कभी-कभी	अक्सर	हमेशा
1	क्या आप काम करते समय भारी सामान उठाते हैं, धक्का देते हैं या खींचते हैं?					
2	क्या आपको अजीब स्थिति में सामान उठाना पड़ता है?					
3	क्या आप अपनी पीठ को जोर से मोड़ते या घुमाते हैं?					
4	क्या आप अपने काम के लिए अपनी बाहों को कंधे की ऊंचाई से ऊपर उठाते हैं?					
5	क्या आप असुविधाजनक मुद्रा में काम करते हैं?					
6	क्या आप काम के दौरान लंबे समय तक बैठे या झुके रहते हैं?					
7	क्या आप लंबे समय तक एक ही मुद्रा में काम करते हैं?					
8	क्या आपको काम के लिए अपने हाथों और उंगलियों से छोटी-छोटी हरकतें करनी पड़ती हैं?					
9	क्या आपके आस-पास अपना काम ठीक से करने के लिए पर्याप्त जगह है?					
10	क्या आपको अपना काम पूरा करने के लिए शारीरिक सहायता की आवश्यकता है?					
11	क्या आपको अपने कार्य कार्यों के कारण होने वाली असुविधा के कारण छुट्टी लेने की आवश्यकता है?					
सी	**व्यावसायिक तनाव**					
	काम का बोझ और समय का दबाव	**कभी नहीं**	**बहुत कम**	**कभी-कभी**	**अक्सर**	**हमेशा**
1	मेरा काम का बोझ बढ़ गया है।					
2	मैं अपने काम के बोझ से दबा महसूस करता हूं।					
3	मुझे अपने कार्यों को पूरा करने के लिए पर्याप्त समय निकालने में कठिनाई होती है।					
4	मैं अक्सर तंग समय-सीमाओं के कारण दबाव महसूस करता हूँ।					
5	जब बहुत अधिक काम संभालना होता है तो मुझे तनाव महसूस होता है।					
6	मैं एक ही समय में अपनी क्षमता से अधिक कार्य अपने हाथ में ले लेता हूं।					
7	मुझे अक्सर ओवरटाइम काम करना पड़ता है।					
8	मुझे अपना काम हमेशा पूर्णता के साथ पूरा करने की आवश्यकता महसूस होती है।					
	नियंत्रण एवं निर्णय लेना	**कभी नहीं**	**बहुत कम**	**कभी-कभी**	**अक्सर**	**हमेशा**
1	मैं अपने काम से संबंधित निर्णय लेने की प्रक्रियाओं में शामिल हूं।					
2	जब मुझे अपने काम में कुछ कहने का अधिकार नहीं होता तो मैं खुद को कमतर आंका हुआ महसूस करता हूं।					
3	मुझे लगता है कि मेरा अपने कामकाज पर पर्याप्त नियंत्रण नहीं है।					
4	मैं अक्सर उन निर्णयों को प्रभावित करने में असमर्थ महसूस करता हूं जो मेरे काम को प्रभावित करते हैं।					
5	मेरे सुझाव अक्सर लागू होते हैं।					
	काम का माहौल	**कभी नहीं**	**बहुत कम**	**कभी-कभी**	**अक्सर**	**हमेशा**
1	मुझे एक आरामदायक और उपयुक्त कार्यस्थल तक पहुंच प्राप्त है।					
2	मैं अपने कार्यस्थल की स्थितियों के कारण तनाव महसूस करता हूं।					
4	इन विकर्षणों के कारण मेरी उत्पादकता नकारात्मक रूप से प्रभावित होती है।					
	कार्य संबंध	**कभी नहीं**	**बहुत कम**	**कभी-कभी**	**अक्सर**	**हमेशा**
1	मैं अपने कार्यस्थल पर अलग-थलग, उपेक्षित और असमर्थित महसूस करता हूं।					
2	मुझे अपने सहकर्मियों के साथ विवादों का सामना करना पड़ता है।					
3	मुझे अपने सहकर्मियों के साथ संवाद करने में कठिनाई होती है।					
4	मैं अपने सहकर्मियों से मदद लेने का विरोध करता हूँ।					

3	I find it difficult to communicate with my colleagues.					
4	I resist taking help from my colleagues.					
	Job satisfaction and motivation	**Never**	**Rarely**	**Some times**	**Often**	**Always**
1	I am satisfied with my current job.					
2	I feel motivated to do well in my job.					
3	My work gives me a feeling of accomplishment.					
4	My skills and abilities are enhancing in my current job.					
	Work-life balance	**Never**	**Rarely**	**Some times**	**Often**	**Always**
1	I struggle to maintain a balance between my work and personal life.					
2	I am not able to spend much time with my friends and family due to my work.					
3	I do not have time for my hobbies and personal activities due to workload.					
4	I am not able to disconnect and even think about work on my days off.					
	Physical and emotional well-being	**Never**	**Rarely**	**Some times**	**Often**	**Always**
1	I feel tired and exhausted due to work frequently.					
2	I have noticed a decline in my overall health due to the work pressure.					
3	I am embarrased to say when I am overloaded with work.					
4	I find it difficult to say no to requests and demands.					
5	I always feel stressed due to work.					
	Support and resources	**Never**	**Rarely**	**Some times**	**Often**	**Always**
1	I am provided with the required resources to efficiently perform my work task					
2	I am unsure of where to seek help or support for work related problems.					
3	I am not satisfied with the support provided by the organisation in managing my work.					
4	I often feel the lack of support needed to cope up with work related challenges.					
	Job security	**Never**	**Rarely**	**Some times**	**Often**	**Always**
1	I feel stable in my current job in terms of job security.					
2	I am confident about the longevity of my role within this organisation.					
3	I feel secure with my career path in this organisation.					
4	I am satisfied with the organisation's policies in terms of job security.					
	Recognition and reward	**Never**	**Rarely**	**Some times**	**Often**	**Always**
1	My work is recognised in this oganisation.					
2	I am satisfied with the incentives and rewards I get for my work.					
3	I get due credit for the type of work I perform.					
4	I am awarded appropriately for reaching important milestones.					
5	I am content with the organisation's policies regarding performance appraisal and recognition.					

	नौकरी से संतुष्टि और प्रेरणा	कभी नहीं	बहुत कम	कभी-कभी	अक्सर	हमेशा
1	मैं अपनी वर्तमान नौकरी से संतुष्ट हूं।					
2	मैं अपने काम में अच्छा प्रदर्शन करने के लिए प्रेरित महसूस करता हूं।					
3	मेरा काम मुझे उपलब्धि की अनुभूति देता है।					
4	मेरी मौजूदा नौकरी में मेरी क्षमताएं और क्षमताएं बढ़ रही हैं।					
	कार्य संतुलन	**कभी नहीं**	**बहुत कम**	**कभी-कभी**	**अक्सर**	**हमेशा**
1	मैं अपने काम और निजी जीवन के बीच संतुलन बनाए रखने के लिए संघर्ष करता हूं।					
2	मैं अपने काम के कारण अपने दोस्तों और परिवार के साथ ज्यादा समय नहीं बिता पाता हूं।					
3	काम के बोझ के कारण मेरे पास अपने शौक और निजी गतिविधियों के लिए समय नहीं है।					
4	मैं अपनी छुट्टी के दिनों में काम से अलग होने या उसके बारे में सोचने में भी सक्षम नहीं हूं।					
	शारीरिक और भावनात्मक स्वास्थ्य	**कभी नहीं**	**बहुत कम**	**कभी-कभी**	**अक्सर**	**हमेशा**
1	मैं बार-बार काम के कारण थका हुआ महसूस करता हूं।					
2	काम के दबाव के कारण मैंने अपने समग्र स्वास्थ्य में गिरावट देखी है।					
3	जब मुझ पर काम का बोझ ज्यादा होता है तो मुझे यह कहने में शर्म आती है।					
4	मुझे अनुरोधों और मांगों को ना कहना कठिन लगता है।					
5	मुझे काम के कारण हमेशा तनाव महसूस होता है।					
	समर्थन और संसाधन	**कभी नहीं**	**बहुत कम**	**कभी-कभी**	**अक्सर**	**हमेशा**
1	मुझे अपने कार्य कुशलतापूर्वक करने के लिए आवश्यक संसाधन उपलब्ध कराए गए हैं।					
2	मैं इस बात को लेकर अनिश्चित हूं कि काम से संबंधित समस्याओं के लिए सहायता या समर्थन कहां मांगूं।					
3	मैं अपने काम के प्रबंधन में संगठन द्वारा प्रदान किए गए समर्थन से संतुष्ट नहीं हूं।					
4	मुझे अक्सर काम से संबंधित चुनौतियों से निपटने के लिए आवश्यक समर्थन की कमी महसूस होती है।					
	नौकरी की सुरक्षा	**कभी नहीं**	**बहुत कम**	**कभी-कभी**	**अक्सर**	**हमेशा**
1	मैं नौकरी की सुरक्षा के मामले में अपनी वर्तमान नौकरी में स्थिर महसूस करता हूं।					
2	मैं इस संगठन में अपनी भूमिका की दीर्घायु को लेकर आश्वस्त हूं।					
3	मैं इस संगठन में अपने करियर पथ को लेकर सुरक्षित महसूस करता हूं।					
4	मैं नौकरी सुरक्षा के संदर्भ में संगठन की नीतियों से संतुष्ट हूं।					
	मान्यता और पुरस्कार	**कभी नहीं**	**बहुत कम**	**कभी-कभी**	**अक्सर**	**हमेशा**
1	इस संगठन में मेरे काम को मान्यता मिली है।					
2	मैं अपने काम के लिए मिलने वाले प्रोत्साहन और पुरस्कार से संतुष्ट हूं।					
3	मैं जिस तरह का काम करता हूं उसका उचित श्रेय मुझे मिलता है।					
4	महत्वपूर्ण मील के पत्थर तक पहुंचने के लिए मुझे उचित पुरस्कार दिया गया है।					
5	मैं प्रदर्शन मूल्यांकन और मान्यता के संबंध में संगठन की नीतियों से संतुष्ट हूं।					
डी	**मनोदैहिक लक्षण**	**कभी नहीं**	**बहुत कम**	**कभी-कभी**	**अक्सर**	**हमेशा**
1	धुंधली दृष्टि					

D	Psychosomatic symptoms	Never	Rarely	Some times	Often	Always
1	Blurred vision					
2	Excessive sweating					
3	Palpitations(fast heartbeat)					
4	Difficulty in breathing					
5	Cold hands and feet					
6	Indigestion/constipation					
7	Stomach pain					
8	Nausea/vomiting					
9	Loss of appetite					
10	Increased appetite					
11	Headache					
12	Weight gain					
13	Weight loss					
14	Sleep disturbances					
15	Restlessness					
16	Lack of confidence					

2	बहुत ज़्यादा पसीना आना					
3	तेज़ धड़कन (दिल की तेज़ धड़कन)					
4	सांस लेने में कठिनाई					
5	ठंडे हाथ और पैर					
6	अपच/कब्ज					
7	पेट दर्द					
8	उल्टी					
9	भूख में कमी					
10	भूख में वृद्धि					
11	सिरदर्द					
12	वज़न बढ़ना					
13	वज़न घटना					
14	निद्रा संबंधी परेशानियां					
15	बेचैनी					
16	आत्मविश्वास की कमी					

Scorecard for Occupational Health Questionnaire

S. No.	Section	Name of the section	Max Score	Individual Score	Percentage
1	B	Work related Musculoskeletal Discomfort	195	B	(B/195)*100%
2		Binary questions	40	a	(a/40)*100%
3		Pain scale question	100	b	(b/100)*100%
4		Physical activity questions	55	c	(c/55)*100%
5	C	Occupational Stress	310	C	(C/310)*100%
6		Workload and Time Pressure	40	a	(a/40)*100%
7		Control and Decision Making	25	b	(b/25)*100%
8		Work Environment	15	c	(c/15)*100%
9		Work relations	20	d	(d/20)*100%
10		Job Satisfaction and Motivation	20	e	(e/20)*100%
11		Work-life Balance	20	f	(f/20)*100%
12		Physical and Emotional Well-being	25	g	(g/25)*100%
13		Support and Resources	20	h	(h/20)*100%
14		Job Security	20	i	(i/20)*100%
15		Recognition and Reward	25	j	(j/25)*100%
16	D	Psychosomatic Symptoms	80	D	(D/80)*100%
		TOTAL	505	E	(E/505)*100%

Annexure 2

Validation Report

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  /CELLRANGE=FULL
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  /HIDDEN IGNORE=YES.
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DATASET NAME DataSet1 WINDOW=FRONT.
COMPUTE Total=Relevance1 + Relevance2 + Relevance3 + Relevance4 + Relevance5 + Representativeness1
    + Representativeness2 + Representativeness3 + Representativeness4 + Representativeness5 + Clarity1
    + Clarity2 + Clarity3 + Clarity4 + Clarity5 + Comprehensiveness1 + Comprehensiveness2 +
    Comprehensiveness3 + Comprehensiveness4 + Comprehensiveness5.
EXECUTE.
CORRELATIONS
  /VARIABLES=Relevance1 Relevance2 Relevance3 Relevance4 Relevance5 Representativeness1
    Representativeness2 Representativeness3 Representativeness4 Representativeness5 Clarity1 Clarity2
    Clarity3 Clarity4 Clarity5 Comprehensiveness1 Comprehensiveness2 Comprehensiveness3
    Comprehensiveness4 Comprehensiveness5 Total
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  /MISSING=PAIRWISE.
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Correlations

Notes

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	Cases Used	Statistics for each pair of variables are based on all the cases with valid data for that pair.

Syntax		CORRELATIONS /VARIABLES=Relevance1 Relevance2 Relevance3 Relevance4 Relevance5 Representativeness1 Representativeness2 Representativeness3 Representativeness4 Representativeness5 Clarity1 Clarity2 Clarity3 Clarity4 Clarity5 Comprehensiveness1 Comprehensiveness2 Comprehensiveness3 Comprehensiveness4 Comprehensiveness5 Total /PRINT=TWOTAIL NOSIG /MISSING=PAIRWISE.
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[DataSet1]

		Relevance 1	Relevance 2	Relevance 3	Relevance 4	Relevance 5	Represent ativeness 1	Represent ativeness 2	Represent ativeness 3	Represent ativeness 4	Represent ativeness 5	Clarity 1	Clarity 2	Clarity 3	Clarity 4	Clarity 5	Comprehens iveness 1	Comprehens iveness 2	Comprehens iveness 3	Comprehens iveness 4	Comprehens iveness 5	Total
Relevance 1	Pearson Correlation	1	-.067	-.096	.065	.075	1.000**	-.045	-.096	.065	.075	1.000**	-.045	-.096	.065	.075	1.000**	-.045	-.096	.065	.075	.356**
	Sig. (2-tailed)		.555	.396	.566	.511	.000	.691	.396	.566	.511	.000	.691	.396	.566	.511	.000	.691	.396	.566	.511	.001
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Relevance 2	Pearson Correlation	-.067	1	.281*	.343**	-.113	-.067	.972**	.281*	.343**	-.113	-.067	.972**	.281*	.343**	-.113	-.067	.972**	.281*	.343**	-.113	.667**
	Sig. (2-tailed)	.555		.011	.002	.320	.555	.000	.011	.002	.320	.555	.000	.011	.002	.320	.555	.000	.011	.002	.320	.000
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Relevance 3	Pearson Correlation	-.096	.281*	1	-.061	-.022	-.096	.272*	1.000**	-.061	-.022	-.096	.272*	1.000**	-.061	-.022	-.096	.272*	1.000**	-.061	-.022	.221*
	Sig. (2-tailed)	.396	.011		.593	.845	.396	.015	.000	.593	.845	.396	.015	.000	.593	.845	.396	.015	.000	.593	.845	.049
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Relevance 4	Pearson Correlation	.065	.343**	-.061	1	-.106	.065	.292**	-.061	1.000**	-.106	.065	.292**	-.061	1.000**	-.106	.065	.292**	-.061	1.000**	-.106	.763**
	Sig. (2-tailed)	.566	.002	.593		.348	.566	.009	.593	.000	.348	.566	.009	.593	.000	.348	.566	.009	.593	.000	.348	.000
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Relevance 5	Pearson Correlation	.075	-.113	-.022	-.106	1	.075	-.133	-.022	-.106	1.000**	.075	-.133	-.022	-.106	1.000**	.075	-.133	-.022	-.106	1.000**	.185
	Sig. (2-tailed)	.511	.320	.845	.348		.511	.240	.845	.348	.000	.511	.240	.845	.348	.000	.511	.240	.845	.348	.000	.100
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Represent ativeness 1	Pearson Correlation	1.000**	-.067	-.096	.065	.075	1	-.045	-.096	.065	.075	1.000**	-.045	-.096	.065	.075	1.000**	-.045	-.096	.065	.075	.356**
	Sig. (2-tailed)	.000	.555	.396	.566	.511		.691	.396	.566	.511	.000	.691	.396	.566	.511	.000	.691	.396	.566	.511	.001
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Represent ativeness 2	Pearson Correlation	-.045	.972**	.272*	.292**	-.133	-.045	1	.272*	.292**	-.133	-.045	1.000**	.272*	.292**	-.133	-.045	1.000**	.272*	.292**	-.133	.641**
	Sig. (2-tailed)	.691	.000	.015	.009	.240	.691		.015	.009	.240	.691	.000	.015	.009	.240	.691	.000	.015	.009	.240	.000
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Represent ativeness 3	Pearson Correlation	-.096	.281*	1.000**	-.061	-.022	-.096	.272*	1	-.061	-.022	-.096	.272*	1.000**	-.061	-.022	-.096	.272*	1.000**	-.061	-.022	.221*
	Sig. (2-tailed)	.396	.011	.000	.593	.845	.396	.015		.593	.845	.396	.015	.000	.593	.845	.396	.015	.000	.593	.845	.049
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80

Represent ativeness 4	Pearson Correlation	.065	.343**	-.061	1.000**	-.106	.065	.292**	-.061	1	-.106	.065	.292**	-.061	1.000**	-.106	.065	.292**	-.061	1.000**	-.106	.763**
	Sig. (2-tailed)	.566	.002	.593	.000	.348	.566	.009	.593		.348	.566	.009	.593	.000	.348	.566	.009	.593	.000	.348	.000
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Represent ativeness 5	Pearson Correlation	.075	-.113	-.022	-.106	1.000**	.075	-.133	-.022	-.106	1	.075	-.133	-.022	-.106	1.000**	.075	-.133	-.022	-.106	1.000**	.185
	Sig. (2-tailed)	.511	.320	.845	.348	.000	.511	.240	.845	.348		.511	.240	.845	.348	.000	.511	.240	.845	.348	.000	.100
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Clarity 1	Pearson Correlation	1.000**	-.067	-.096	.065	.075	1.000**	-.045	-.096	.065	.075	1	-.045	-.096	.065	.075	1.000**	-.045	-.096	.065	.075	.356**
	Sig. (2-tailed)	.000	.555	.396	.566	.511	.000	.691	.396	.566	.511		.691	.396	.566	.511	.000	.691	.396	.566	.511	.001
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Clarity 2	Pearson Correlation	-.045	.972**	.272*	.292**	-.133	-.045	1.000**	.272*	.292**	-.133	-.045	1	.272*	.292**	-.133	-.045	1.000**	.272*	.292**	-.133	.641**
	Sig. (2-tailed)	.691	.000	.015	.009	.240	.691	.000	.015	.009	.240	.691		.015	.009	.240	.691	.000	.015	.009	.240	.000
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Clarity 3	Pearson Correlation	-.096	.281*	1.000**	-.061	-.022	-.096	.272*	1.000**	-.061	-.022	-.096	.272*	1	-.061	-.022	-.096	.272*	1.000**	-.061	-.022	.221*
	Sig. (2-tailed)	.396	.011	.000	.593	.845	.396	.015	.000	.593	.845	.396	.015		.593	.845	.396	.015	.000	.593	.845	.049
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Clarity 4	Pearson Correlation	.065	.343**	-.061	1.000**	-.106	.065	.292**	-.061	1.000**	-.106	.065	.292**	-.061	1	-.106	.065	.292**	-.061	1.000**	-.106	.763**
	Sig. (2-tailed)	.566	.002	.593	.000	.348	.566	.009	.593	.000	.348	.566	.009	.593		.348	.566	.009	.593	.000	.348	.000
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Clarity 5	Pearson Correlation	.075	-.113	-.022	-.106	1.000**	.075	-.133	-.022	-.106	1.000**	.075	-.133	-.022	-.106	1	.075	-.133	-.022	-.106	1.000**	.185
	Sig. (2-tailed)	.511	.320	.845	.348	.000	.511	.240	.845	.348	.000	.511	.240	.845	.348		.511	.240	.845	.348	.000	.100
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Comprehens iveness 1	Pearson Correlation	1.000**	-.067	-.096	.065	.075	1.000**	-.045	-.096	.065	.075	1.000**	-.045	-.096	.065	.075	1	-.045	-.096	.065	.075	.356**
	Sig. (2-tailed)	.000	.555	.396	.566	.511	.000	.691	.396	.566	.511	.000	.691	.396	.566	.511		.691	.396	.566	.511	.001
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Comprehens iveness 2	Pearson Correlation	-.045	.972**	.272*	.292**	-.133	-.045	1.000**	.272*	.292**	-.133	-.045	1.000**	.272*	.292**	-.133	-.045	1	.272*	.292**	-.133	.641**
	Sig. (2-tailed)	.691	.000	.015	.009	.240	.691	.000	.015	.009	.240	.691	.000	.015	.009	.240	.691		.015	.009	.240	.000
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Comprehens iveness 3	Pearson Correlation	-.096	.281*	1.000**	-.061	-.022	-.096	.272*	1.000**	-.061	-.022	-.096	.272*	1.000**	-.061	-.022	-.096	.272*	1	-.061	-.022	.221*
	Sig. (2-tailed)	.396	.011	.000	.593	.845	.396	.015	.000	.593	.845	.396	.015	.000	.593	.845	.396	.015		.593	.845	.049
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Comprehens iveness 4	Pearson Correlation	.065	.343**	-.061	1.000**	-.106	.065	.292**	-.061	1.000**	-.106	.065	.292**	-.061	1.000**	-.106	.065	.292**	-.061	1	-.106	.763**
	Sig. (2-tailed)	.566	.002	.593	.000	.348	.566	.009	.593	.000	.348	.566	.009	.593	.000	.348	.566	.009	.593		.348	.000
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Comprehens iveness 5	Pearson Correlation	.075	-.113	-.022	-.106	1.000**	.075	-.133	-.022	-.106	1.000**	.075	-.133	-.022	-.106	1.000**	.075	-.133	-.022	-.106	1	.185
	Sig. (2-tailed)	.511	.320	.845	.348	.000	.511	.240	.845	.348	.000	.511	.240	.845	.348	.000	.511	.240	.845	.348		.100
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Total	Pearson Correlation	.356**	.667**	.221*	.763**	.185	.356**	.641**	.221*	.763**	.185	.356**	.641**	.221*	.763**	.185	.356**	.641**	.221*	.763**	.185	1
	Sig. (2-tailed)	.001	.000	.049	.000	.100	.001	.000	.049	.000	.100	.001	.000	.049	.000	.100	.001	.000	.049	.000	.100	
	N	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Annexure 3

Ethical Clearance

SANTOSH
Deemed to be University
(Established u/s 3 of the UGC Act, 1956)

F. No. SU/R/2024/1344[35] Dated: 17.05.2024

Subject: Grant of Ethical Clearance for **Dissertation Protocol** Topic **"Work Related Musculoskeletal Discomfort and Occupational Stress Among Helath Care Workers"**, submitted by **JASPREET KAUR,** student of Master in Hospital Administration, 2022 Batch.

*****

With reference to the request for grant of Ethical Clearance for the Dissertation Protocol entitled **"Work Related Musculoskeletal Discomfort and Occupational Stress Among Helath Care Workers"**, **JASPREET KAUR** is informed that the **Dissertation Protocol** submitted by him/her was considered by the **Screening Committee** of the **Allied Health Sciences** in its meetings held on 07.02.2024 and 29.02.2024. The recommendations of the **Screening Committee** were considered in detail by the **Institutional Ethics Committee** in its meeting held on **15.05.2024** and the same was **approved** by the **Ethics Committee** of the **Santosh Deemed to be University, Ghaziabad, Delhi NCR**.

He /She is informed accordingly for further necessary action.

17/5/24

[Dr. EZHILRAJAN. K]
REGISTRAR

JASPREET KAUR
Master in Hospital Administration.

Copy to:

1. The Vice Chancellor
2. The Dean – Academics
3. The Dean, SMC&H
4. The Dean – Research
5. The Director - IQAC
6. HOD/ Course In-charge of the concerned Department.

Annexure 4

Certificate by Statician

SANTOSH Deemed to be University

SANTOSH Central Research Facility

CENTER FOR INTERDISCIPLINARY RESEARCH AND INNOVATION

To Whom It May Concern

This is to certify that the Post-Graduate Dissertation entitled **"Work-Related Musculoskeletal Discomfort and Occupational Stress among Healthcare Workers: A Cross-Sectional Study"** by Mr./**Ms.**/Dr. **Jaspreet Kaur**, Department of **Hospital Administration** (PhD/MD/MS/MDS/MSc/**MHA**), Batch - **(2022-24)** has been carefully assessed and authenticated by the Assistant Prof-Cum Bio-statistician of Santosh Deemed to be University.

This certification is issued based on the examination and review conducted by the Biostatistician, confirming adherence to statistical principles and practices.

Date: 24.07.2024

Signature:

Vikash Singh Patel

(Assistant Professor cum Bio-Statistician)

Department of Community Medicine,

Santosh Deemed to be University

Ghaziabad, Delhi (NCR)

Annexure 5

Plagiarism Report

Work-Related Musculoskeletal Discomfort and Occupational Stress among Healthcare Workers: A Cross-Sectional Study

ORIGINALITY REPORT

3%
SIMILARITY INDEX

PRIMARY SOURCES

1	livrepository.liverpool.ac.uk Internet	83 words — < 1%
2	www.unn.edu.ng Internet	35 words — < 1%
3	innspub.net Internet	34 words — < 1%
4	bmcpsychiatry.biomedcentral.com Internet	23 words — < 1%
5	estia.hua.gr Internet	23 words — < 1%
6	text-id.123dok.com Internet	19 words — < 1%
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Annexure 6

Consent Form

SANTOSH MEDICAL COLLEGE AND HOSPITAL (GHAZIABAD)

INFORMED CONSENT

I _____ Son/Daughter/Wife of _____ resident of _____.

hereby declare that I give my full, free and voluntary informed consent in the thesis – **"Work-Related Musculoskeletal Discomfort and Occupational Stress among Healthcare Workers: A Cross-Sectional Study",** _____ has informed me to my full satisfaction, in the language I understand, about the purpose, nature of study and various investigations for the study to be carried out. I have been informed about the duration of the study and instructions to be followed during the study period.

I give full consent for being enrolled in the above study and I reserve my rights to withdraw from this study, whenever I wish.

Name: Date:

Signature of candidate:
Or thumb impression

We have witnessed that the candidate signed the above form in the presence of his free will after fully understanding its content.

Signature of Investigator
Name: Jaspreet Kaur
Designation: PG, Department of Hospital Administration
Contact No.- 9643010489

<u>संतोष मेडिकल कॉलेज एवं अस्पताल (गाजियाबाद)</u>

<u>सहमति पत्र (सूचित)</u>

मैं _____ बेटा / बेटी /पत्नी_____

निवासी _____ घोषणा करता हूं कि

डॉ ._____, ने मुझे मेरी भाषा में अपने अध्ययन "**<u>Work-Related Musculoskeletal Discomfort and Occupational Stress among Healthcare Workers: A Cross-Sectional Study</u>**" के उद्देश्य के बारे में, और अध्ययन के दौरान अपनाई जाने वाली विभिन्न प्रयोगशाला जांच के बारे में सूचित कर दिया है। मुझे अध्ययनकी अवधि और उसके दौरान अपनाए जाने वाले निर्देश भी मेरी भाषा मे समझा दिए गए हैं| मैं उपरोक्त अध्ययन में बिना किसी दबाव के पूर्ण सहमति दे रहा हूं |

नाम

हस्ताक्षर

दिनांक:

मेरी उपस्थिति में मरीज ने पूरी तरह से डाकटर के बताए गए अध्ययन और निर्देशों को समझने के बाद अपनी स्वतंत्र इच्छा से ऊपर के फार्म पर हस्ताक्षर किए हैं ।

नाम: जसप्रीत कौर

पदनाम: पीजी

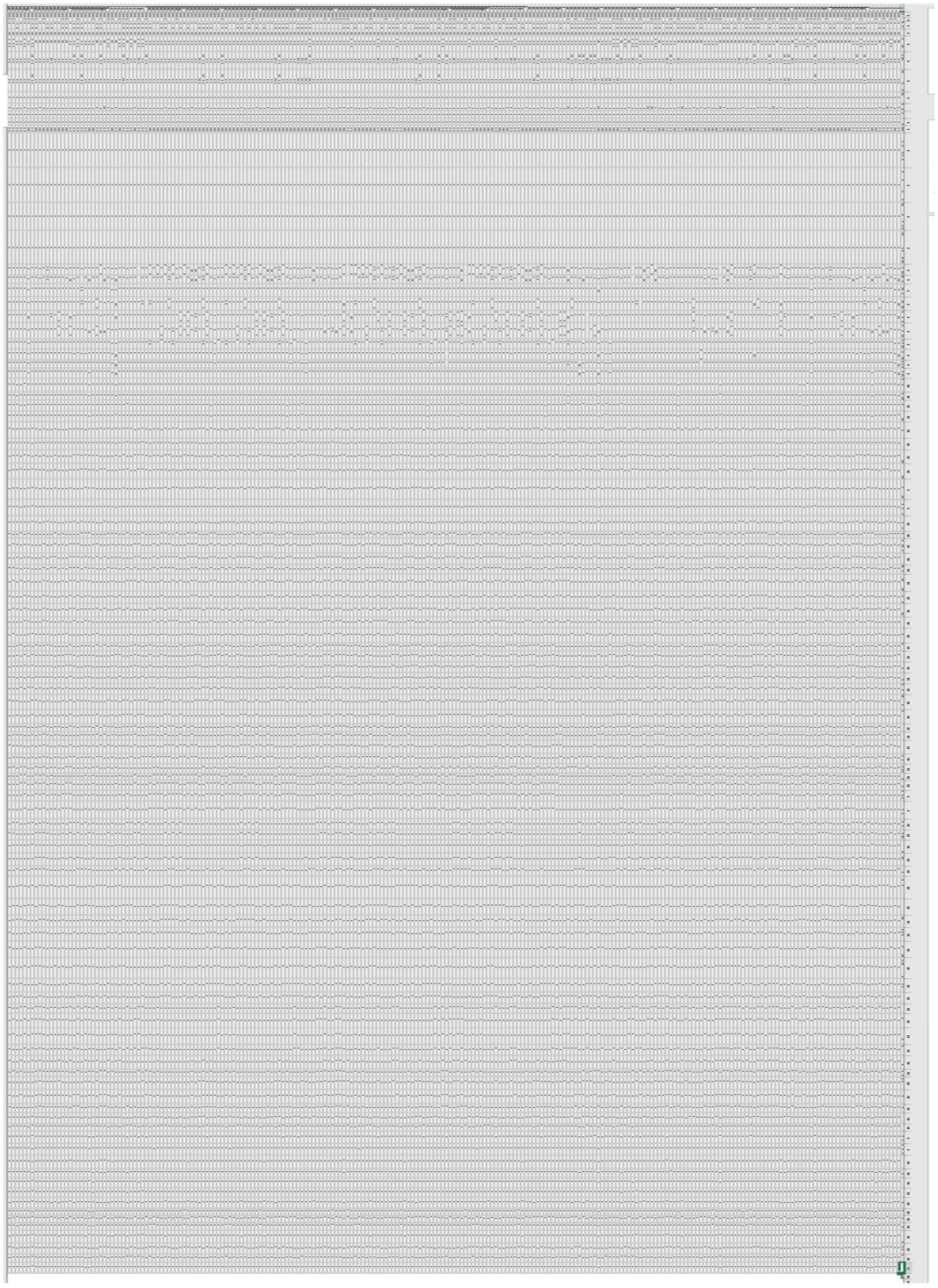
अस्पताल प्रशासन विभाग

संपर्क नंबर- 9643010489

Annexure 7

Master Chart Outline

Parameter	No. of questions	Likert Scale for frequency				
		1 - Never	2- Rarely	3- Some times	4- Often	5- Always
Analysis of Gender	1	Male		Female		
Analysis of Age	1	18-30		31-50	51-65	
Work-related musculoskeletal discomfort	12 to 20	1	2	3	4	5
Workload and time pressure	5 to 10	1	2	3	4	5
Control and decision making	4 to 8	1	2	3	4	5
Work environment	3 to 6	1	2	3	4	5
Work relations	3 to 6	1	2	3	4	5
Job satisfaction and motivation	5 to 10	1	2	3	4	5
Work-life balance	3 to 7	1	2	3	4	5
Physical and emotional well-being	4 to 8	1	2	3	4	5
Support and resources	3 to 8	1	2	3	4	5
Job security	2 to 4	1	2	3	4	5
Recognition and reward	6 to 8	1	2	3	4	5
Psychosomatic symptoms	15 to 20	1	2	3	4	5

Annexure 8

Master data sheet